



FRIDAY, MAY 25, 1894.

CONTENTS.

ILLUSTRATIONS:	PAGE.	Trade Catalogues	375
C. N. O. & T. P. Fruit Car . . .	366	GENERAL NEWS:	
The New Union Station at Boston . . .	367	Locomotive Building	377
A Portion of an Information Sheet—Pennsylvania Railroad . . .	369	Car Building	377
Special Car Wheel Machinery . . .	370	Bridge Building	377
CONTRIBUTIONS:		Meetings and Announcements	378
Lining Track	365	Personal	378
Von Borries' Smoke Stack	365	Elections and Appointments	379
EDITORIALS:		Railroad Construction	379
Pooling and the Anti-Pooling Law	372	General Railroad News	380
High Speed and Quick Action Brakes	373	Traffic	380
The Johnstone, Double-Bogie Compound Locomotive	373	MISCELLANEOUS:	
April Accidents	374	Technical	375
Editorial Notes	375	The Scrap Heap	376
New Publications	375	The Missouri River	365
		Stock and Debt Watering	367
		Train Accidents in the United States in April	369
		Traffic of St. Mary's Falls Canal	370
		Railroad Matters in Chicago	375

The office of the Railroad Gazette is now at 32 PARK PLACE, New York.

Contributions.

Lining Track.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I note with interest the communications on this subject in your issue of May 18.

The method used on this road is to set center stakes 100 ft. apart, which give the principal points in the general line; the intermediate line being obtained by the foreman sighting from one point to another. On curves our track centers are set at 50 and 25 ft. intervals, according to the sharpness of the curve, and the intermediate line is obtained by the track foreman lining in with his eye. This method is used when the track is given a general rearrangement. I find a great deal of difficulty in obtaining satisfactory line on our track, owing to the individuality of the different foremen, and I am now investigating this matter to determine the best practical way to secure perfect line in detail, and in order to get a uniform good alignment over the entire system.

CHIEF ENGINEER.

Von Borries' Smoke Stack.

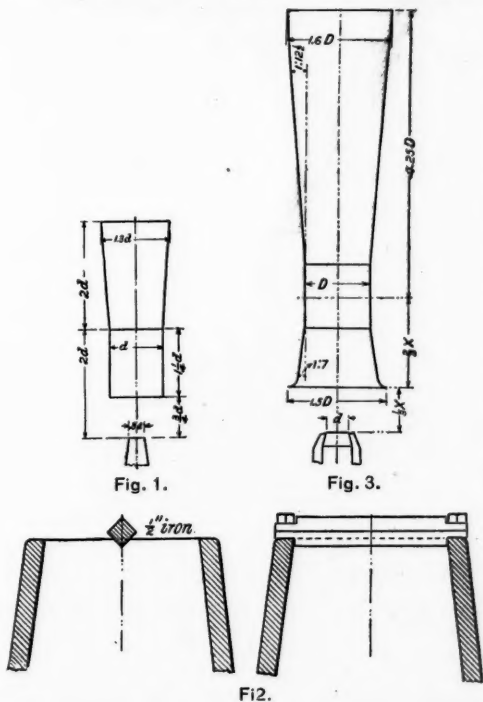
HANNOVER, May 5, 1894.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of April 20, page 281, I find a brief description of the so-called "wide smokestack" and bridge, which I found to be the best in a number of experiments. I beg to add some further explanation to prevent misleading applications of the rules given there.

The advantages of the wide stack, Fig. 1, over the narrower one, Fig. 3, generally used in Germany, are better steaming, less consumption of fuel, and less cinders, when the engine is forced to its full power. These advantages are realized by the more equal draught produced by the wide stack. For running with short cut-off, the old stack, Fig. 3, is very good, but with strong blast the draught becomes too unequal.

The filling of the stack by the steam jet depends much



upon the form of the exhaust pipe. If this is straight and vertical, the steam jet would not fill the wide stack if the

nozzle had no bridge, and the steaming would be quite insufficient. Only with certain forms of exhaust tubes as used here, the bridge can be dispensed with.

The great advantage of that simple bridge is, that the steam jet may be regulated by it in such manner that it fills the stack in the most favorable way. Some easy experiments with bridges of different breadth and nozzles of different diameter, will lead to the best dimensions. For the diameter of the nozzle I recommend $\frac{1}{8}$ d to $\frac{1}{4}$ d; for the breadth (diagonal) of the bridge $\frac{1}{10}$ to $\frac{1}{8}$ of this diameter.

Bridges of similar kinds were occasionally used by drivers long ago; but our experiments first led to an advantageous use of them. I hope to send you a copy of the report I am preparing on these experiments in one or two months.

VON BORRIES.

The Missouri River.*

BY O. B. GUNN, C. E.
(Concluded from page 273.)

BRIDGES.

The Mississippi River below its junction with the Missouri River retains all of the principal characteristics of the Missouri as to its crooked and fickle channel, its bed of sand, silt and quicksand, and its banks of alluvium, easily undermined and carried away. Above its junction with the Missouri River its channel is more stable, its bed is of sand and gravel, and at many points, like Keokuk, Montrose and Rock Island, the bed is of solid rock. As a result, the piers of the many railroad bridges across the Mississippi are founded upon piles or the bare bedrock. These conditions render the cost of construction of Mississippi River bridges much less than the cost of constructing bridges across the Missouri River, in proportion to their length, and no engineer would care to risk his reputation by building bridge piers in the Missouri River, founded upon piles, as the rapid current at flood tide would be almost certain to scour away the loose sand and silt, undermine the piers, overturn them, and destroy any superstructure built upon them.

The first bridge across the Mississippi River was built at Rock Island in the interest of the Chicago, Rock Island & Pacific Railroad Company, about 30 years ago, by an old-time famous bridge builder, L. B. Boomer. It was a wooden Howe truss, upon masonry piers, long since destroyed, and succeeded by a fine iron Pratt truss bridge, located a few hundred feet farther down stream than the Howe bridge. This first bridge across the great "Father of Waters" raised a great legal contest over the right of a railroad to cross a navigable stream upon a bridge, on account of the necessary obstruction of navigation. After a long and hotly contested legal battle the Supreme Court finally decided that railroads, being great arteries of interstate commerce, must be conceded the right to cross navigable streams upon bridges, subject only to such reasonable regulations as Congress might make to protect the interests of navigation. This point being finally settled, it was not long till the Chicago, Burlington & Quincy Railroad Company procured a Congressional charter, and under its provisions built the iron railroad bridge across the Mississippi River at Quincy, Ill. This consisted of two draw spans, each 160 ft. clear span, and numerous spans of 180 ft. each, and a total length of about three-quarters of a mile, besides 500 ft. additional, across a slough, on the Quincy side of the river. It was built 25 years ago by Mr. T. C. Clarke as Chief Engineer, and was considered at the time a marvel of engineering skill; but in the light of engineering science of the present day the only remarkable thing about it is its great length.

In the construction of the Quincy bridge, Mr. T. C. Clarke filled the place of Engineer, on whose designs the substructure was made, and also the place usually occupied by the contractor; that is, the bridge was built by day's work, and all the men were employed, and all the means of executing the work were designed, by him, as may be read in his History of the Quincy Bridge, published by Van Nostrand in 1870. This was the first American bridge where concrete foundations made under water were used on a large scale. All work was done under water, by men above water, without cofferdams. The whole bridge is 3,200 ft. long and was completed in 14 months. It is hardly fair to say that the only remarkable thing about the Quincy bridge is its great length. Mr. Morison reporting on it a couple of years since said that although its details, such as cast iron upper chords and welded lower chord links, would now be condemned, yet the superstructure is in good order and will last 10 years before renewal will be necessary. A life of 35 years, during half of which the bridge has carried rolling stock of nearly double the weight it was designed to carry, is somewhat remarkable. Another point is that no failure of foundations has ever been found; and there have been no accidents to river craft at any time. Not the least remarkable fact is that it has paid 10 per cent. to its stockholders from the beginning. Of no other bridge on the Mississippi River can these things be said.—EDITOR.]

The first bridge across the Missouri River was built at Kansas City by the Hannibal & St. Joseph Railroad Company, and the engineering problems presented and overcome were much greater than those encountered at Quincy, as it involved the sinking of some of its piers, 40 or 50 ft., through sand, silt and quicksand to bedrock, which was then done by pumping and excavating in open cofferdams, a very tedious and expensive operation.

*Extracts from a paper read before the Engineers' Club of Kansas City, March 12, 1894.

[We believe that no pumps were used. The caissons were open, but the material was excavated by chain dredges without removal of water.—EDITOR.]

The many railroads concentrating at the many towns and cities on the Mississippi and Missouri rivers have caused the construction of many railroad bridges to accommodate their traffic. It is a fact worth noting that upon the Mississippi River, where there is much navigation by steamboats, tugs and barges, all the bridges above St. Louis are drawbridges, while upon the Missouri River, where there is scarcely any navigation, and above Kansas City none at all, many of the bridges are "high bridges," that is, 50 ft. from high water to the lower chords of the bridges, to allow steamboats to pass under them at any stage of the water, thereby involving a much greater expense for construction than would be required by the construction of low drawbridges.

The Missouri River Improvement Commission, for some unaccountable reason, is opposed to drawbridges across the Missouri, always advocating high bridges; hence it has been difficult to get a charter for a drawbridge, and latterly, when a charter has been granted for a drawbridge by Congress, it has been granted for draw spans of great length, as if to exhaust the skill of the engineer or the purse of the builders. The latest in this direction is the new drawbridge at Omaha, the draw span said to be 525 ft. long, the longest in the world, and this to pass one tramp boat a year, and a score or more of United States boats, as at Atchison. Comment is unnecessary.

There are always conditions connected with the location of a railroad bridge which ought to determine whether a high or low bridge shall be adopted, and several mistakes in this respect, involving the expenditure of large sums of money, have been made in locating bridges across the Missouri River. The first of these mistakes was made at Leavenworth, about 23 years ago, in building a high bridge at Fort Leavenworth, instead of a low bridge at Leavenworth City. The bridge at Fort Leavenworth cost \$800,000, of which \$250,000 was paid by the city to have it planked and approaches made for wagon traffic. The Chicago, Rock Island & Pacific Railroad Company used it for several years to bring their trains across the river, but it proved so inaccessible for wagon traffic that it has never been of much use to the city. This grave mistake has at last been remedied by the construction of a drawbridge immediately in front of the business portion of the city, and it will hereafter be used by the two railroads which are in operation on the opposite side of the river. The Rock Island Railroad Company has abandoned the use of the old bridge, which hereafter will be used only by the "Maple Leaf" Railroad, and as all the wagon traffic left it on the opening of the new bridge on the 2d of last month, the traffic of the "Maple Leaf" cannot possibly furnish one-half the revenue to keep it in repair and to pay operating expenses and interest. The investment of the Dutch bondholders will in consequence be almost a total loss. The cost of the new bridge is but little more than one-half the cost of the old one, and it was a very grave and expensive mistake that the right location and the right kind of a bridge were not adopted in the first place.

Atchison and St. Joseph were more fortunate in securing drawbridges located at the right places and where they would do those cities the most good. The Chicago line of the Atchison, Topeka & Santa Fe crosses the Missouri River at Sibley, about 25 miles below Kansas City, upon a splendid high bridge, where the conditions were all greatly in favor of a drawbridge. The cost of this great bridge is given by the railroad company at \$1,750,000, a princely sum to pay for a bridge, where not an average of one steamer per week, for six months in the year, passes under it. The construction of a drawbridge similar to the one built by the same company across the Mississippi River at Fort Madison, Ia., where there is a great deal of river navigation, would have saved the railroad company a million dollars, shortened the line nearly a mile, and saved a large amount of curvature and heavy grading.

But the greatest folly in the way of bridge building across the Missouri, or any other river, is the half-finished structure, partly in Kansas City, known as the Winner Bridge, with its mile and a half of decayed trestle rising out of the pawpaw brush of Clay County to a height of 50 ft. or more at the river; its tall piers and enormously long river spans, waiting in vain for the great steel superstructure which never came, stretching its long line of piers over streets, alleys and innumerable railroad tracks, and finally burying its south abutment in the high bluffs overlooking the east bottoms. One cannot but wonder what fantastic vision possessed the brain of its originator and promoter, and pity the poor deceived and deluded people of all grades and conditions who, in furnishing a half-million dollars from their accumulated hard earnings to build the piers of this gigantic and misconceived structure, literally cast their bread upon the murky waters of the Missouri River, never to return.

Only two serious disasters have occurred to Missouri River bridges. Both of those happened to the Wabash Railroad bridge at St. Charles, Mo., where on two succeeding occasions, two or three years apart, one of its channel spans, 320 ft. long, fell 60 ft. into the river, the falling span in each case carrying a freight train with it, and on each occasion several lives were lost. These disasters were so serious as to cause the entire reconstruction of the superstructure of the bridge at great cost, and the loss of business to the Wabash Railroad, in consequence of these two spans falling while loaded with heavy freight trains, was very great.

About fifteen years ago the north span of the Hannibal & St. Joseph Railroad bridge, in Kansas City, was burned, and replaced by an iron span. A few years later the span next to it was lifted from its piers and hurled into the river during a fierce tornado. This span was also immediately replaced with an iron span. Also, about fifteen years ago the east span of the Union Pacific Railroad bridge at Omaha, an iron span 250 ft. in length, was lifted bodily from its piers and thrown down upon the sandbar below it. These last three accidents carried with them no loss of life nor loss of business to the respective railroads using them.

POSSIBILITIES OF STEAMBOAT NAVIGATION BETWEEN KANSAS CITY AND CHICAGO.

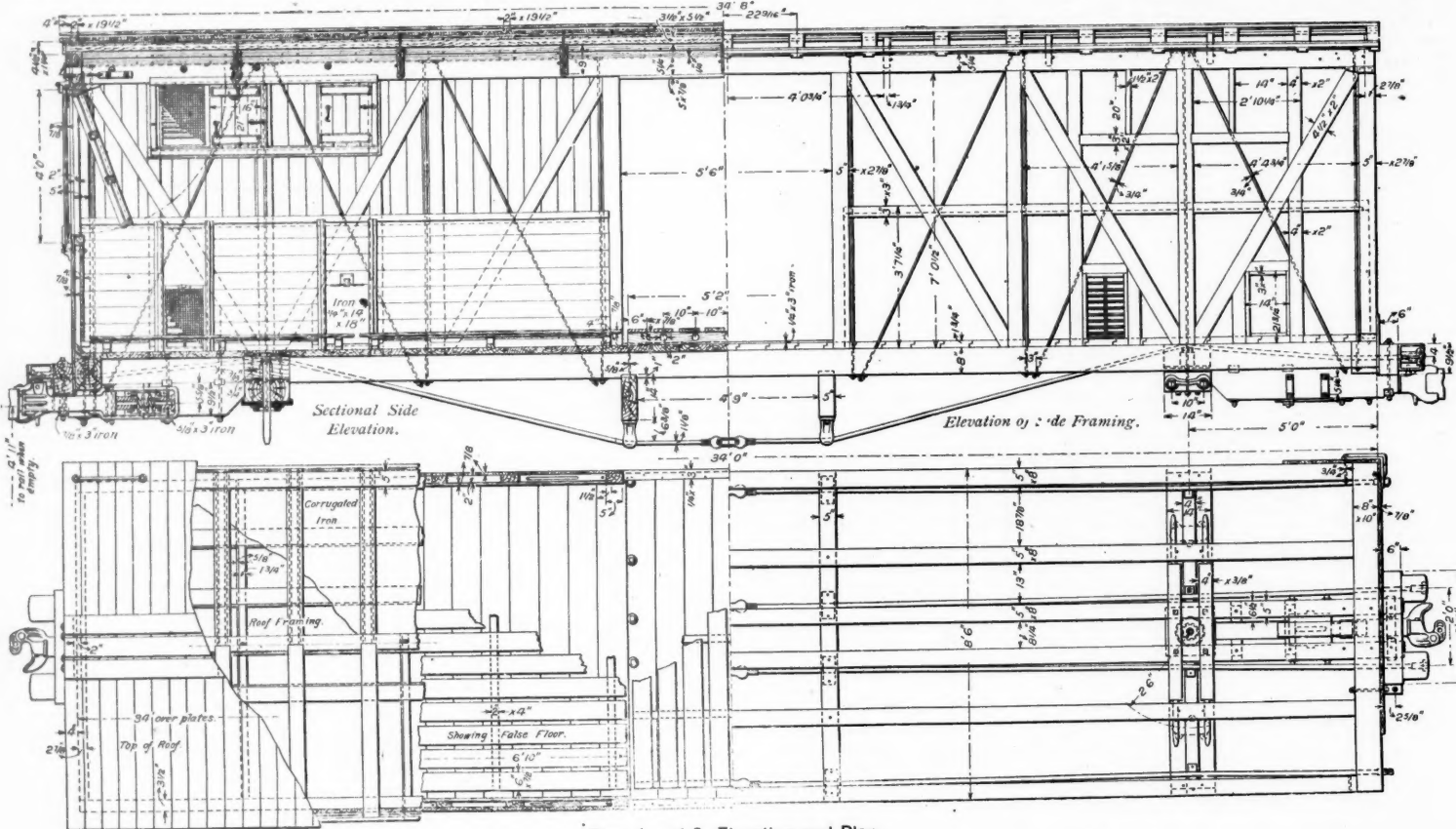
As heretofore stated, the river route from Kansas City to St. Louis is too short a line, and railroad competition too active, and our commercial relations with St. Louis too limited to make navigation profitable. But if the route could be extended to Chicago, and there connect with the

River, and a navigable channel from Chicago to the Mississippi River, 14 ft. in depth, via the Illinois River, is provided for, thus making Lake Michigan the source of the Illinois River. . . . This is the "Chicago Main Drainage Canal," but its scope is much greater than its name indicates, as the following quotation from a letter received from L. E. Cooley, Esq., a member of the Board of Trustees, shows:

"The drainage channel is designed to be part of the navigable connection between the Lakes and the Mississippi, and the expenditures which we are now making on 30 miles of the summit level is considerably in excess of that required to carry 14 ft. of water for navigation from the present terminus of our channel, or 280 miles, to the Mississippi River. This expenditure is about \$25,000,000. The channel now under contract for 25 miles is through rock for 14 miles, with a width of 160 ft., and practically vertical sides; in earth 202 ft. wide at bottom, and 290 ft. at the water line. The nominal depth of water is to be 22 ft.; when it is finally connected with the lake, through the city, it will have a depth of 24 ft. at low water, and 26 ft. at mean lake level, and will then have

Mississippi River Commission below St. Louis, we may carry 14 ft. through to the Gulf for seven to nine months and a less depth for the remainder of the year. . . . In all our developments south, the 14 ft. is to be regarded as only provisional, and in harmony with a progressive policy which shall develop greater depths, as public needs demand, and growing demands justify."

Time and space will not allow a further explanation of the plans of the Drainage Board, but enough has been said to show that there is already a "way out" being provided for the navigation of the lower Missouri River to again become an active factor in the prosperity of Kansas City. With a 14-ft. low water channel provided for us from the mouth of the Missouri River to Chicago and the Great Lakes, the Government should then see that there is a navigable channel kept open from Kansas City to the mouth of the river. Then with a fleet of steamers running from Kansas City to Chicago, the great entrepot, money and commercial centre of the West, touching each way at St. Louis, who can doubt that such a line and such a route



Figs. 1 and 2—Elevation and Plan.

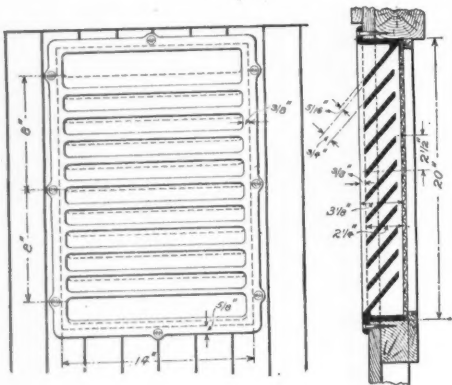
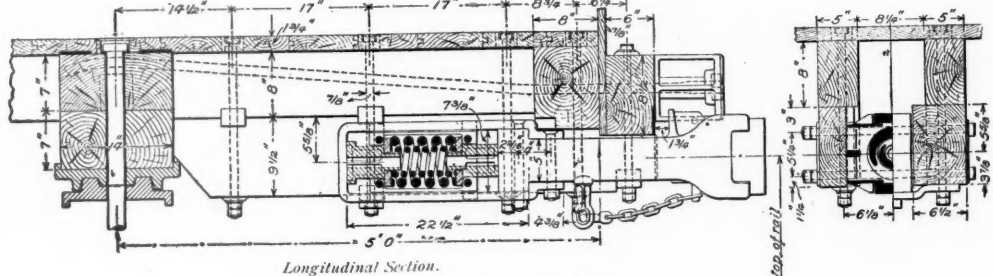


Fig. 6—Ventilator.



Longitudinal Section.

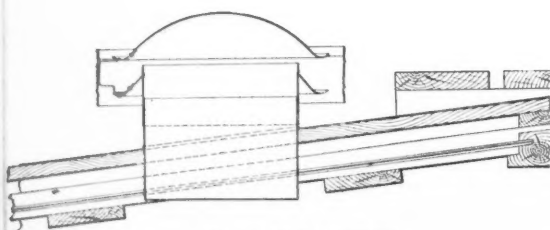
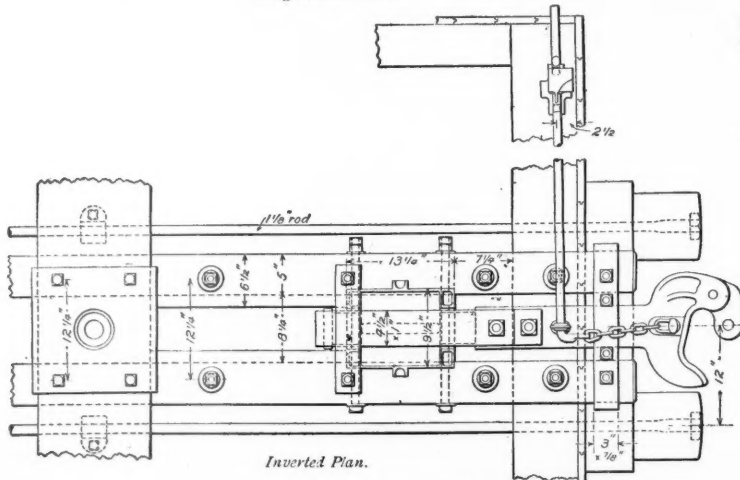


Fig. 7—Roof Ventilator.



Inverted Plan.

Fig. 5—Draft Rigging.

STANDARD 60,000 LBS. FRUIT CAR, CINCINNATI, NEW ORLEANS & TEXAS PACIFIC RAILWAY.

navigation of the Great Lakes and the traffic of the great commercial centre of the West, then the situation would be very different, and it is more than probable that navigation could once more be restored to the lower Missouri River, and that it would once more become an active factor in our prosperity. . . . A navigable channel is now being cut from Lake Michigan, at Chicago, to the Illinois

a length of 32 to 33 miles, according to the route taken. In addition to its use for sanitary purposes, and as part of the route to the Mississippi, it will have a large local utility as a harbor 30 miles long for deep-draft lake vessels and for ocean craft when the lakes are connected with the seaboard. It will be our first endeavor, however, to push the 14-ft. level through to the Mississippi, in the expectation, based on careful investigation, that in conjunction with the improvements now under way by the

would pay, and become a great success? The distance from Kansas City to the mouth of the river by water route is 390 miles; from the mouth of the river to Chicago, via Illinois river and drainage canal, is 349 miles, a total from Kansas City to Chicago, by water, of 739 miles. Between the two cities by rail the average distance of five trunk lines of railroad is 491 miles.

C. N. O. & T. P. Fruit Car.

The engravings show the construction and general appearance of the standard fruit car of the Cincinnati, New Orleans & Texas Pacific Railway, one of which was shown at the World's Fair. This exhibition car was built by the Elliott Car Co., of Gadsden, Ala., and briefly mentioned in the *Railroad Gazette* of June 30, 1893. It has a rated capacity of 60,000 lbs., a length over sills of 34 ft., and width over sills of 8 ft. 6 in. The length in the clear is 33 ft. 6 in. and the clear width 8 ft. The box framing is rather lighter than common, the door and corner posts being 5x2 1/2 in. in section, the remaining posts 4x2 in., and the braces 4 1/2 x 2 in. in section. The side and roof framing is all of yellow pine. The carlines and end plates are turned into the side plates and the plates drawn together by 1/2 in. transverse tie rods. The roof used is that manufactured by the Chicago Car Roofing Co., and is laid on carlines 1 1/4 in. in thickness and 10 in. deep at center. The side and center sills are 5x8 in. and the intermediate sills 4x8 in. in section. The sills are reinforced by four truss rods 1 1/4 in. in diameter, the outer rods lying just inside the sills and the inner rods just outside the center sills, and passing through end sills, deadwood and deadblocks. The needle beams are of oak 14 in. in depth and 5 in. thick, with the sills let in 1 in. at the top. The bolster is of oak 14 in. wide, 7 in. deep, and stiffened with a strap and rod truss, common to this form of bolster, passing over the center sills and diagonally downward through the intermediate

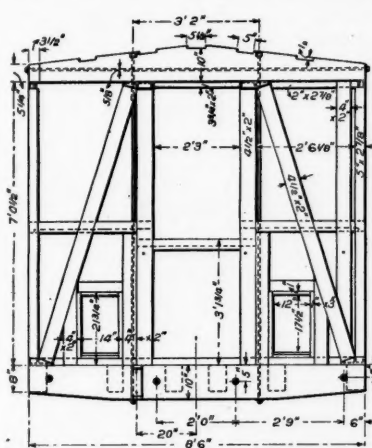


Fig. 3.—End Framing.

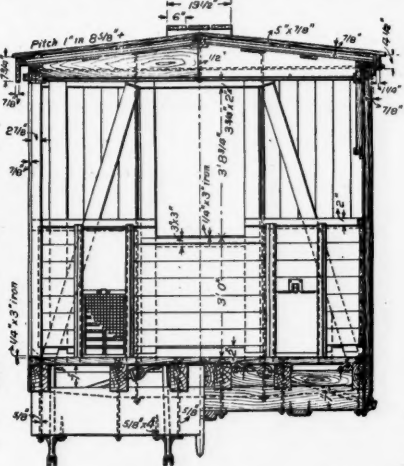


Fig. 4.—Sections Through Door and Bolster.

sills. Upon the bolster and between the sills are wooden blocks or spaces 4 1/2 in. in depth, over which are carried the truss rods, the rods resting on suitable cast iron blocks. The draft sills, which are of oak and 9 1/2 in. deep, are securely bolted and keyed to center sills, and butt against the bolster. The Butler draft rigging is used in conjunction with the Elliott M. C. B. coupler. The arrangement of draft rigging, as shown in Fig. 5, is standard on the fruit cars of the company, and is being used in renewals on all 40,000 lb. cars. The floor of the car is of yellow pine, 1 1/2 in. in thickness. Upon the floor rests a sectional false floor of 6x 1/2 in. boards laid upon 2x4 in. pieces placed on edge, in which are bored 2 in. holes at intervals of about 10 in. This permits of a circulation of air beneath the cargo, and the floor being laid in sections and removable, can be taken out at any time, if desired.

The doors, which are of the usual grated form, are hung and furnished with the Dunham equipment. The ventilators, shown in detail in Fig. 6, are placed as shown in Figs. 1 and 4. There are also ventilators of a smaller size but of similar design placed in the end plates near the roof. The end door, which is of a construction similar to the side door swings inward as indicated in Fig. 1. The roof ventilators are of the Globe pattern and shown in detail in Fig. 7.

The side and end framing, as already observed, is of yellow pine, the space between sheathing and siding being but 2 in. The diagonal tie rods are of 3/4 in. iron and the vertical tie rods of 5-8 in. diameters, both having taper heads which rest upon wrought iron washers set into the top of the plate their full depth. Cast iron washers are used on the lower ends. The car in the main shows evidence of careful designing, coupled with a desire to reduce materially the dead weight.

Stock and Debt Watering.*

It is creditable to Massachusetts that, so far as our railroads are concerned, stock-watering methods have not been carried to the extent to which they have been carried in other parts of the country. This is due partly to restrictive legislation and partly to the conservative character and general business honesty of our people. Open and avowed watering of stock or debt seldom takes place in Massachusetts. It is accomplished here under cover. There are two methods of watering in disguise, to which there is good reason for calling your attention at the present time.

The first is watering under cover of purchase and sale or consolidation. Frequently the first step toward the consolidation of two railroads is a lease. The authority to make such lease is readily obtained from the legislature, and the matter attracts but little attention. Such lease however, when made, determines the relation of the corporation to the public, it may be, for a century. It is truly this first step which costs. Under special legislative

authority granted in general terms, corporation "A" leases the franchises and property of corporation "B" for a period of ninety-nine years, agreeing to assume all the debts of corporation "B," and to pay a fixed dividend on its stock, which dividend is generally considerably in excess of that previously earned. Such excess is the greater the more deeply those who control corporation "A" are interested, directly or indirectly, in the stock of corporation "B." In such case there is no actual watering of securities, and yet the payment of the dividend on the stock of corporation "B," which was previously optional, has now become an obligation or debt upon corporation "A," in the same way that the payment of interest on its bonds and on the bonds of corporation "B" is a debt. The fixed charges of the two corporations have, therefore, been increased by the amount of rental or dividend agreed to be paid on the stock of corporation "B."

As a rule, the legislature in granting authority to one corporation to lease the franchises of another, imposes no restrictions as to the terms of the lease, has no knowledge as to whether they are to be reasonable, and reserves no supervision or control of them. A few years after the lease has been executed, consolidation is proposed. It is urged with good reason that, inasmuch as the relation of the two corporations have been determined by the terms of the lease, it is unwise to continue the expense of keeping alive for a century two separate organizations, and that no additional harm will be done to the public, even though it may prove necessary to water somewhat the stock or bonds, in order to carry out the basis fixed by the terms of the lease.

If, now, examination is made of the special acts by which the legislature from time to time authorizes one corporation to purchase the property and franchises of another, and to issue stock and bonds in payment thereof, it will be found that stock-watering is guarded against by the provision that the capital stock of the purchasing company

shall not exceed the total capital stock of the two companies before consolidation. On the other hand, these acts will generally be found to contain a provision authorizing the purchasing company to issue bonds to such amount as may be requisite to carry out the terms of the purchase. This provision gives an opportunity for watering securities to such extent as the stockholders or directors of the respective roads may agree upon. When, under such special acts, watering does not take place, it is only because the managers do not see fit to avail themselves of their opportunity.

Such acts, by limiting the amount of stock to be issued, hold out the pretense that the watering of securities is guarded against, when in reality another equally convenient gate is left wide open. It must not be overlooked that, when a corporation is authorized to purchase the property and franchises of another corporation and to issue its stocks and bonds in exchange therefor, it is authorized to capitalize the value of the franchises purchased.

No legislature would for a moment entertain the direct proposition to allow a corporation to capitalize the value of its franchises given to it, as they are, without cost, and yet the capitalization of such value is always indirectly involved when the legislature authorizes one corporation to sell or lease the property and franchises of another.

It by no means follows that purchase and sale or lease should never be permitted, but it does follow that all acts relating thereto should, before passage, be vigorously examined by competent authority, and that no lease or sale should become valid and binding until its terms are approved by the railroad commissioners, a board specially qualified to intelligently protect the interests of the public.

The second form of watering, to which it is fitting to call attention at the present time, is that which occurs under cover of construction companies. If the charter authorizes the issue of capital stock and bonds to an amount which is in excess of the actual cost of construction and equipment, and the organizers of the corporation are unscrupulous, they are apt to seek for some way in which they can appropriate to themselves such excess of bonds or stock as may not be needed to raise the amount necessary to pay construction and equipment expenses. A simple way to accomplish this end is to organize a construction company, and then "A," "B," and "C," under the name of the railroad or other company, make a contract with themselves under the name of the construction company by which the construction company agrees to do the work and the railroad or other company agrees to pay therefor in stock and bonds, the par value of such stock and bonds being perhaps double the actual reasonable cash cost of the work. "A," "B," and "C," under the cover of the construction company, negotiate as much of the securities to pay the expense of doing the work, and divide the balance of the securities among themselves. This indirect method of misappropriating the securities is regarded as much more safe than more direct methods which would accomplish the same ends. This scheme can not be carried out unless the railroad company has authority to issue an amount of stock and bonds which is greater than the actual cash cost of the work.

Turning now our attention to the general laws of Massachusetts relating to street railroads, it will be found that such companies can not issue stock except upon the payment into the treasury of the company of its par value in cash. It will also be found that they can not issue bonds secured by mortgage except to pay for real estate and for construction and equipment, and only to such amount as the railroad commissioners, after investigation, may deem necessary

therefor, and the application of the proceeds of such bonds to purposes other than those specified is expressly prohibited. Therefore, a street railroad company organized under general laws, and issuing stock and bonds in accordance therewith, is limited in its issues to the amounts actually needed, and there is no field of usefulness for a, construction company. If this agency is to be availed of some means must be discovered of securing authority to issue more stock and more bonds than are actually needed for legitimate purposes. The obvious way to accomplish this end is to go to the legislature, and, under some pretext or other, get special permission to issue a specified amount of stock and bonds. That amount need not be in excess of the amount reasonably necessary to build the railroad described in the act. If it were, suspicion would be aroused. After the charter is obtained, however, it is not necessary to build the whole of the proposed railroad. It is only necessary to build enough to enable the operators to negotiate their securities to advantage.

Now it will be found that there has been a perfect rush by street railroad companies to secure from the legislature special authority to issue capital stock and bonds. Seven such bills have already passed both branches of the legislature; three more are now pending in one branch or the other; eight more have been petitioned for, but have not yet been reported on.

The use of electricity as a motive power has given a great impetus to street railroad construction, and we are, without doubt, upon the threshold of a great construction period. In the State of Massachusetts the track mileage of street railroads for the year ending Sept. 30, 1892, increased over 20 per cent., and each mile of track, including accompanying equipments, etc., was represented on the average by securities to the amount of \$47,000.

Construction periods in railroad building are the most dangerous, because they furnish the best and largest opportunities for stock watering, and whet the appetite of those who are willing to grow rich through fleecing the public. The times, therefore, are such that all special legislation should be carefully watched. There are other suspicious circumstances—as ten years ago, in 1883, the North River Construction Company in its prospectus stated it had among its assets securities of the par value of \$75,000,000, received for work costing in reality only \$34,000,000. So to-day, in 1893, we find that, in the annual report of one of the great electric construction companies, that portion of its assets which consists of stocks and bonds in local lighting and railroad companies is taken at about \$6,000,000, while the par value of such stocks and bonds is more than twice that amount. It is not stated that \$6,000,000 was the total cost of the work done, but the profits of the construction company have been exceedingly satisfactory, even though figured on that basis.

I am also informed that there is on file at the State House in Massachusetts the returns of at least one corporation, organized a year or two ago under special act, similar to those now pending, in which the stock is returned as of no value. Inasmuch as the company claims to have been operated at a profit, the natural inference is that the actual cost of the road was not the sum total of the par value of the stock and bonds issued, but only equaled the face value of the bonds. Furthermore, hints are heard from time to time that the provisions of such bills as those now pending, in some way or other, directly or indirectly, enable the promoters of street railroad companies to make themselves rich by issuing larger amounts of stock and bonds than are necessary to provide the means for the actual cost of construction.

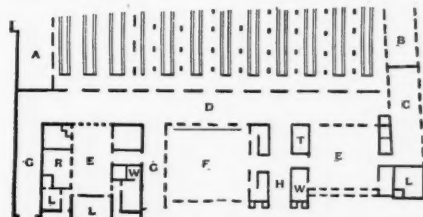
If there is anything wrong it is a great deal better to find it out now than to wait until the securities are issued. It is a great deal better to prevent the organization of endowment orders than to expose their iniquities after the public has been victimized. Now is the time to determine whether our street railroad securities shall be first-class investments or gambling investments.

The conclusions reached, then, are that electric street railroad construction should not be conducted under special acts, but should be conducted under general laws, adapted to the actual needs of sound business management; that issues of stock and bonds should be carefully limited by official supervision in such amounts as may be necessary to meet the reasonable cash cost of construction and equipment, and that stringent provisions should be made prohibiting the application of the proceeds of stock or bonds to other than legitimate purposes. The board of railroad commissioners, and not the legislature, is the proper authority to determine what amount of securities shall be authorized.

The New Union Station at Boston.

Within about three weeks the new Union station in Boston will be fully occupied, the Fitchburg railroad being about ready to begin running its passenger trains to and from that station. The three divisions of the Boston & Maine have been using it for several months.

The problem of this station has been long pending and was a difficult one. The stations of both the Boston & Maine and the Eastern roads were small, old and utterly inadequate. The Lowell road had a costly station, but it was almost outgrown. Finally, the directors decided that a new station must be erected and that the best location was on Causeway street, where the Lowell station could



Headhouse of New Union Station, Boston.

A, baggage room, inward; B, express room, outward; C, baggage room, outward; D, main corridor; EE, waiting rooms; F, cab stand; GG, exits; LL, women's room; R, restaurant; T, ticket office; WW, men's lavatory.

be utilized as a part of it, and Messrs. Shepley, Rutan & Coolidge, prominent architects of Boston, prepared plans. In the meantime Boston had been struggling with a rapid transit scheme, which included a plan for an elevated station for the northern roads at another point on Causeway street. But the railroad companies did not look upon it with favor and the Boston & Maine proceeded to take steps for the erection of a "temporary" station. At first, the needs of the Fitchburg road were not considered, but,

*Extract from a paper presented at the recent convention of Railroad Commissioners. By Hon. George G. Crocker, formerly of the Massachusetts Board of Railroad Commissioners.

finding that the track problem would be very greatly simplified if that road was admitted, negotiations with the Fitchburg resulted in materially enlarging the plan for the station so as to accommodate that road, also.

The construction of the new station necessitated the tearing down of the old Eastern station and two large freight houses, and, of course, the latter involved the removal of the freight business to another location. The tracks of

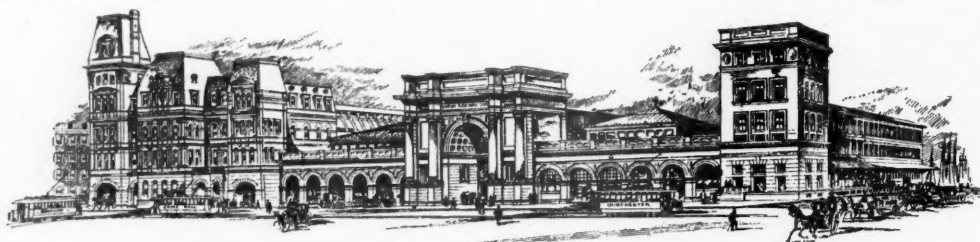
seven tons, is ornamented with a handsomely carved eagle. The interior of this arch is lined with 32 sunken panels of granite, and the entire arched roof is of tinted glass, over 12,000 separate pieces.

On the left of this entrance is a spacious cab-stand, 101 x 108 ft., paved with concrete and with granolithic side-walks running round three sides. An iron truss monitor roof, with large windows, covers the apartment, and

width of the train shed, and 50 ft. wide. A high iron fence with numerous gates separates this corridor from the tracks. The corridor is floored with hard pine and beneath it run the steam pipes for heating the station and the waiting cars. The platforms between the tracks are 18 ft. wide and are covered with granolithic pavement. They are even with the tops of the rails, and as the ties are all planked over, baggage trucks can be run across the tracks at any point desired. The Boston & Maine will put another step on all the passenger cars, as soon as possible. Twenty-three tracks run into the train house. They are arranged in pairs, with the exception of No. 17.

In utilizing the 23 tracks to the best advantage, it has been found advisable to regard the station in fact, as well as in name, a Union station, and not as four separate stations under one roof. In other words, in running the 569 daily trains, it is intended to send all outward trains from the eastern side of the station, while inward trains will come in on the west side. The operator in the signal tower will, however, use his judgment and run a train in on the east side whenever necessary to prevent delay.

The light and heat plant is spoken of as the largest and finest isolated electric plant in the country. There are twelve 125 H. P. boilers, built by the Swampscott Machine Co. They are of the horizontal return-tube type, 72 in. diameter, with 130 3-in. tubes 17 ft. long. Six supply steam under 80 lbs. pressure for heating, and six at 125 lbs. for the engines. To avoid the great expense of erecting a tall chimney, two 11-ft. Sturtevant fans, run by independent engines, are used to force a draft. There are two Ingersoll air compressors for furnishing compressed air for the interlocking. Beneath these compressors is a pit containing the feed pumps and the tank which receives the return water from the heating pipes of the passenger station. These boilers furnish heat also for the passenger

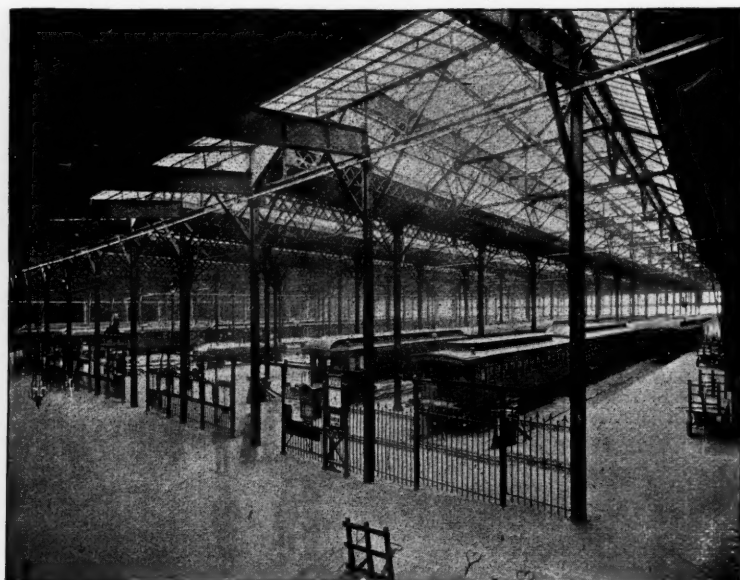


Union Passenger Station, Boston & Maine and Fitchburg Railroads, Boston.

the Haymarket Square station had to be moved some fifty feet to the eastward, where they crossed Causeway street. The work of demolition and construction began in February, 1893, and the rapidity with which the work has been carried on is remarkable.

The site of the new station is on made land (as, by the way, is the case with all the terminal passenger stations in Boston), and thousands of piles had to be driven before the foundations could be laid. The plans for the new station made it necessary to erect a large pile structure in Charles River for the station yard, and not only the consent of the Harbor and Land Commissioners of the State, but also that of the Secretary of War was necessary. The

large arched windows and swinging doors separate it from the train house. Between this cab-stand and the main entrance corridor are located the news-stand and a small lunch and fruit stand. The dining-room is in the old part of the building. On the right of the main entrance is the general waiting room, 98 ft. square, with a high iron monitor roof with many windows. Northrop's stamped steel ceiling, walls of white pressed brick with terra cotta trimmings, large windows of tinted glass, a floor of Italian marble, and gas and electric light fixtures of old brass, make this a handsome apartment. Swinging doors open from the waiting room into the train house, and also, on the opposite side, into a corridor and thence into



VIEWS OF THE INTERIOR OF THE TRAIN SHED OF THE NEW UNION STATION AT BOSTON.

consent of both was obtained, but with the express proviso that the road "shall rebuild all its bridges over the Charles River on stone or iron piers . . . and shall remove from the river all of the piles of the said bridges within ten years from date." The hint of permanency that the foundations gave has been more than realized, for the thick brick walls and huge granite structure that gives character to the main entrance, lend color to the suspicion that the officials of the road hardly regard it as a "temporary" edifice.

From the moment that work upon the new station was begun there has been no let-up. For a large portion of the time, both night and day gangs have been employed. The first step was the demolition of the two large freight houses which stood next to the Fitchburg station. This ground was filled with piles 60 ft. long. Large granite blocks were next placed on top of these piles as the foundation of the new structure. The eastern end of the new station was first erected and made ready for occupancy before the Eastern station was demolished. The offices in the latter were removed. Stout cables were placed around the tower, two or three locomotives were harnessed to the cables, and the iron horses brought the edifice down to the ground.

Some idea of the new structure can be obtained from the accompanying cut, showing the front elevation. The Boston & Lowell station forms the left or western end of the edifice, and the new portion extends, one story in height, toward the right. The entire structure has a frontage of 568 ft. on Causeway street, the new part being 363 ft. front, while the Lowell station is 205 ft., and, including the train shed, nearly nine acres are covered by the station.

The most noticeable feature of the front elevation is the massive grand entrance in the centre. It is built entirely of cut granite; is 80 ft. wide by 70 ft. high, the arch itself being 30 ft. wide, 100 ft. long and 50 high. On either side of the arch are two fluted columns, 34 ft. 3 in. high, resting on bases 5 ft. square. The huge keystone, weighing

Causeway street. Between the main entrance and the general waiting room are two large apartments. One is the ticket office, having half a dozen windows opening into the general waiting room, an equal number into the main entrance corridor, and six more into a corridor connecting the main entrance with the waiting room. The other apartment is the men's lavatory, finished in white marble. On the opposite side of the waiting room are the women's rooms, an entrance to the baggage room and a package room. A telegraph office, a telephone room and an office for Pullman car tickets are also connected with the waiting room.

The five-story tower at the right hand corner of the building is 45 ft. square, and back of it is a three-story wing, forming the eastern side of the train house. This extends along Haverhill street 318 ft. The lower story is about equally divided between the outward baggage room and the American Express Co.'s outward department. The two upper stories are occupied by the various division offices of the Boston & Maine.

The entire edifice is built of face brick with granite trimmings. The inside of waiting rooms, lavatories, and cab-stand is finished with white pressed brick with terra cotta trimmings. The offices are finished with quartered white oak.

But one hardly realizes the extent of this establishment until he enters the train shed, of which we show two interior views. The heavy brick wall separating the arched train shed of the Lowell station from the new structure has been taken out, leaving simply the iron arches, thus throwing the entire 23 tracks into one vast shed 472 ft. wide by 540 ft. long, and capable of housing 184 cars. The new portion is covered by a truss roof of nine spans, eight being 39 ft. wide and each covering two tracks, while the other covers only one track. The structure is of steel and glass, the entire weight being estimated at 1,500 tons and the glass alone being sufficient to cover four acres. This roof is supported by 128 iron columns. Between the head house and the tracks is a long corridor extending the entire

cars. There are six engines of the Westinghouse automatic compound condensing type, five being 200 H. P. each and one 100 H. P. There are also two direct coupled 125-volt generators of 125 kilowatts capacity, for lighting the station; two direct coupled 500-volt generators of 125 kilowatts capacity, for operating the drawbridges, turntables, etc.; one belted 220-volt generator, 62 kilowatts capacity, for the elevator motors; and two belted alternators for furnishing lights for Mystic wharf and the other distant freight yards. These machines are all compound wound. In addition there is a direct-coupled shunt-wound generator of 7½ kilowatts capacity, to charge the storage batteries for the switches and signals. The engine room equipment and mechanical draft plant were furnished by Westinghouse, Church, Kerr & Co. of Boston.

The track problem of the new station was very difficult. Three large signal towers have been erected, one just across the Charles River draw, one at Somerville, and one at Prison Point, about midway between the other two. The one at Somerville is equipped with mechanical apparatus, while the others have the electro-pneumatic. The plant at Prison Point, where the Fitchburg freight tracks cross, has 30 working levers which operate 49 switches and 7 sets of movable frogs, and 82 detector bars and 41 signals.

The tower near the drawbridge contains the largest machine. It has 60 levers, operating 45 single switches, 3 double slips with rigid frogs, one single and 17 double slips with movable frogs, 200 detector bars, 80 semaphore signals, and 37 dwarf signals. A 23-track indicator shows the operator the condition of the tracks in the station. This machine is the largest in this country.

Reference has been made to the removal of two freight houses on Causeway street, and the transfer of the business to another location. The Boston & Maine, for some ten years past, has been gradually acquiring property in or near Boston, for freight purposes, until, at the present

* A plan of the tracks was published in the *Railroad Gazette* March 31, 1893.

time, it owns some 456 acres, most of which is already in use. These grounds are not all together, and a very small area is in Boston proper, but still all are within a convenient distance from the business portion of the city. The old freight yard of the Boston & Lowell road, on Lowell, Brighton and Everett streets, is the only yard in the city proper. There are six freight houses here and there are tracks for about 200 cars. The old freight yard at East Cambridge has been rearranged and tracks added, so that the 14 acres furnish storage room for 340 passenger cars. On Front street, Charlestown district, there is storage capacity for 40 cars, and a freight house 26 ft. wide by 1,500 ft. long, used entirely for outward freight. At Rutherford avenue, Charlestown, there are 98 acres of made land with room for 2,500 cars. There are ten freight houses already built, with room for as many more. Eight of the houses have been built within two years. Five are each 600 ft. long and five 420 ft., each having a width of 50 ft., making in all 255,000 square feet of floor space. Not far from this yard is a tract of 102 acres known as the McLean Asylum property; this was bought about a year ago, and is yet comparatively unimproved, but some day will afford storage for 8,000 cars. The Mystic wharf property, near Chelsea, is, perhaps, as valuable for commerce as any belonging to the road. Here are 75 acres with storage room for 1,000 cars; a long wharf at which three of

Train Accidents in the United States in April.

COLLISIONS.
REAR.

4th, on Cleveland & Pittsburgh, near Minerva, Ohio a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking 2 cars. A brakeman and 3 tramps were injured.
9th, on Fort Worth & Denver City, near Rhome, Tex., a freight train descending a grade broke in two and the second portion afterward ran into the forward one while it was standing at a water tank, wrecking 3 cars; conductor and one brakeman injured.
9th, on Erie & Pittsburgh, near Homewood, Pa., a freight train ran into the rear of a preceding freight, derailling 2 cars and injuring 2 trainmen.
12th, on New York Central & Hudson River, near Brighton, N. Y., a freight train ran into the rear of a work train, damaging 3 cars. One employee was injured.
12th, 3 a. m., on New York, New Haven & Hartford, at Portchester, N. Y., a westbound passenger train, approaching the beginning of the four-track section of the road was thrown upon the wrong track by a mistake of the signal man, and ran into the rear of a freight train standing just beyond the switch. The caboose was wrecked and fell off a bridge into the street below, and a freight car was wrecked and burned up. The freight conductor was badly injured and two other trainmen slightly injured.
14th, on Missouri, Kansas & Texas, at Checotah, I. T., a freight train ran into the rear of a preceding freight, badly damaging the caboose. A driver was injured.
20th, on Cumberland Valley road, at Greason's, Pa., a passenger train ran into some freight cars which had been

13th, on Pennsylvania road, at Morris Junction, Pa., collision between a passenger train and a train of coal cars with the engine at the rear, wrecking the passenger engine and 5 coal cars; engineer and one passenger injured. It is said that the collision was due to a misplaced switch.

15th, on Lehigh Valley, at Silver Brook, Pa., butting collision between a passenger train and a freight, wrecking both engines and a dozen freight cars. A man riding on one of the freight cars was killed and 7 trainmen and 7 passengers were injured. It is said that the freight was running on the time of the passenger train without leave.

17th, on Mobile & Ohio, near Corinth, Miss., butting collision of freight trains, badly damaging both engines and 20 cars. Three brakemen were injured. It is said that one of the trains had disregarded a telegraphic order.

30th, on St. Louis, Keokuk & Northwestern, at St. Louis, Mo., butting collision of freight trains in the yard, making a bad wreck. A fireman was killed.

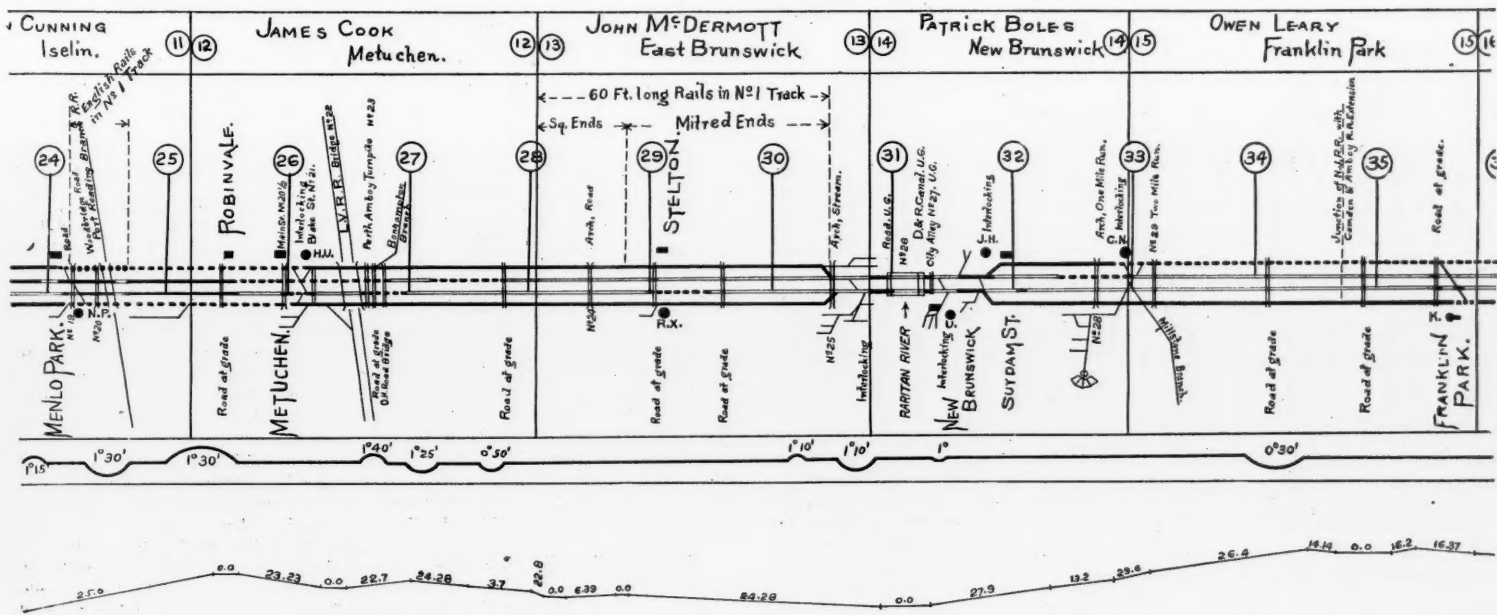
CROSSING AND MISCELLANEOUS.

5th, on Pennsylvania road, at Patton, Pa., a locomotive of the Beech Creek Railroad was run into by eight loaded cars which had run away from a side track on a steep grade, and the engine and cars were badly wrecked. Two trainmen were badly injured. It is said that the safety switch at the outlet to the side track had been tampered with.

6th, on Illinois Central, at Cairo, Ill., a collision of switching trains in the freight yard did considerable damage and one engineman was badly injured. His engine was started by the collision, the throttle having been forced open, and it ran some distance out on the main track, but was stopped before damage was done.

SMITH, NEWARK, N. J.

DIVISION "B."



RAIL INDEX (See Track Plan): 90 lbs. Rail; ——— 85 lbs. Rail; - - - - - 75 lbs. Rail; ===== 70 lbs. Rail; ——— Less Than 70 lbs. Rail.
BALLAST INDEX (See Alignment Plan): ——— Broken Stone; ——— Gravel; ——— Cinder.

A Portion of an Information Sheet—Pennsylvania Railroad.

the largest ocean steamers can lie at any tide; another wharf where 10 schooners can load, at one-time, coal or lumber; a freight shed with nearly two acres of floor space and an elevator of 1,750,000 bushels capacity, with facilities for unloading 27 cars in 20 minutes.

Track Information Sheet—Pennsylvania Railroad.

In our issue of April 13, appeared a reproduction of Harriman's information sheet as adopted for use on the New York, New Haven & Hartford Railroad. Mr. Joseph T. Richards, Engineer of Maintenance of Way of the Pennsylvania Railroad, having seen that engraving, sends us a blue-print of a similar sheet prepared for the Pennsylvania Railroad, and we have reproduced in the engraving a small portion of that sheet, taking only such part as could be reduced to the size of our page without bringing it down so small as to obscure the details. Concerning this, Mr. Richards says, "the idea is to have in a nut shell what the engineer may be called upon to use at times and places where the large plans, profiles, etc., usually found in his office, are not available. We have compiled, in what we think a convenient manner, a record that can be folded or rolled to suit the pocket, desk, or 'grip' on a tour of inspection. This diagram shows at a glance such items as State lines, county lines, mile posts, supervisors' divisions, and names of supervisors, sub-divisions and names of foremen, with their addresses, location of stations, signal towers with their letters for telegraphic call, bridges with their numbers, the alignment giving direction and degree of curves; profile with grades per mile, different weights of rail in each track; kind of ballast, whether stone, gravel or cinder, water stations, etc., etc. "The vertical height of the sheet carrying this information, is six inches, and it folds conveniently into 4x6in. for the pocket or desk. Of course much can be added to this, as we are doing from time to time, and yet not obliterate or confuse the information."

thrown upon the main track and the engine and baggage cars were overturned. Two passengers were injured.

21st, 9 a. m., on Williamsport & North Branch Railroad, near Pensdale, Pa., an engine ran into the rear end of a freight train, wrecking the caboose, in which were 6 passengers. One of these, the daughter of the superintendent of the road, was killed and 2 others were injured. It is said that the engineman disregarded a signal.

26th, on Pittsburgh, Fort Wayne & Chicago, at Bucyrus, Ohio, a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, badly damaging 7 cars. Two men stealing rides were fatally injured and several others less seriously.

27th, on Philadelphia & Reading, near Excelsior, Pa., a freight train descending a grade broke in two and the rear portion afterward ran into the forward one, wrecking 25 cars. A man stealing a ride was fatally injured.

28th, on Atchison, Topeka & Santa Fe, near Bellville, Tex., a freight train which had been stopped on account of a hot box on an oil car was run into at the rear by a following freight, although, according to the accounts, the conductor had gone back half a mile with a red signal. A driver, a section master and one engineman were injured.

29th, on Louisville & Nashville, near Argyle, Fla., a freight train ran into the rear of a preceding freight, badly damaging several cars. One conductor was injured. And 5 others on 5 roads, involving 1 passenger train and 5 freight trains.

BUTTING.

5th, 1 a. m., on Lehigh Valley, at Green's Bridge, N. J., collision between an eastbound and a westbound freight train, the former drawn by two engines, badly damaging all three engines. One fireman jumped off and fell 80 feet, being badly injured. There was a dense fog at the time.

7th, on Union Pacific, near Hilliard, Wyo., butting collision between a work train and a freight train, both running slowly, with the intention of looking out for each other. Three trainmen were injured. There was a blinding snow storm at the time.

11th, on Lehigh Valley, at Port Bowley, Pa., butting collision between a passenger train and a freight engine, doing considerable damage. The engineman and a car inspector were injured.

11th, on New York, New Haven & Hartford, at Maromas, Conn., butting collision between a passenger train and a freight, derailling both engines. It is said that the freight was running on the time of the passenger train, but both trains were moving slowly. Two brakemen were injured.

17th, at Prison Point, Boston, Mass., a switching engine of the Boston & Maine ran into the side of a Fitchburg passenger train, badly damaging the engine and two passenger cars. Two passengers were injured.

And nine others on eight roads, involving five passenger and ten freight trains.

DERAILMENTS.
DEFECTS OF ROAD.

17th, on Cincinnati, Hamilton & Dayton, near Ottawa, O., a wrecking train was derailed by a spreading of rails and the tool car overturned. Two employees were injured.

22d, on Grand Trunk, near Wenlock, Vt., a freight train was wrecked by running upon a bridge which had been weakened by a freshet. The engineer was killed and the fireman injured.

30th, on Florida, Central & Peninsular, near Plant City, Fla., a passenger train fell through a trestle bridge which had been weakened by fire and the engine was overturned, the mail car tumbled down a bank and the express car wrecked. The engineer and fireman were badly injured. A fire started in one passenger car, but it was quickly put out.

And 4 others on 4 roads, involving 1 passenger train and 3 freight and other trains.

DEFECTS OF EQUIPMENT.

4th, on Pennsylvania road in the tunnel at Ardara, Pa., a car in a freight train broke down, making a slight wreck. About the same time a train running in the opposite direction was disabled in the tunnel, so that the clearing of the wreck took a long time.

5th, on Lehigh Valley, near Upton, N. Y., a freight train was derailed by the breaking of a driving wheel tire. The conductor was killed and 1 brakeman fatally injured.

6th, on Pittsburgh, Cincinnati, Chicago & St. Louis, near Cambridge City, Ind., a freight train was derailed by broken axle and 5 cars loaded with street cars were run into the ditch. A brakeman was injured.

9th, on Buffalo, Rochester & Pittsburgh, near Gainesville, N. Y., a freight train was derailed by a broken wheel and 7 cars were wrecked; conductor and 1 brakeman badly injured.

19th, on Cleveland & Pittsburgh, near Bedford, O., a freight train was derailed by a broken axle and 27 cars were wrecked. A brakeman was injured.

26th, on New York Central & Hudson River, at Camillus, N. Y., the rear car of a passenger train was derailed by the breaking of the drawgear and 1 passenger was injured.

28th, on Pennsylvania road, near Downingtown, Pa., an

east bound freight train was derailed by a fallen brake-beam and several cars fell over upon the west bound track, where they were struck by a west bound train, and 19 cars altogether, were wrecked. A man stealing a ride on one of the trains was killed and another injured. A brakeman was also injured.

And 13 others on 11 roads, involving one passenger train and 12 freight and other trains.

NEGLIGENCE IN OPERATING.

5th, on Delaware & Hudson, near Rouse's Point, N. Y., a passenger train was derailed at a misplaced switch and the engine and baggage car were overturned. Three trainmen were injured.

10th, on Pittsburgh, Cincinnati, Chicago & St. Louis, near Hartford City, Ind., a freight train was derailed and the engine and 14 cars fell down a bank. Two trainmen were killed and one trainman and two tramps injured. The engine had pulled into a side track to take coal and had backed out and coupled to its train; on starting forward again the train ran through the side track, unnoticed by the engineer, the switch having been left set for that track, and the derailment occurred at the outgoing end of the siding.

11th, on Chesapeake & Ohio Southwestern, at Memphis, Tenn., three cars of a switching freight were derailed at a misplaced switch and overturned. One car loaded full of dynamite was thrown upon its side, some of the sills were broken and the trucks detached, but the dynamite did not explode.

15th, 4 a. m., on Illinois Central, near Jackson Park, Chicago, an engine left unattended was seized by a drunken man and run some distance at reckless speed. It was derailed by the derailling switch at a junction, before serious harm had been done.

26th, on Boston & Maine, at Greenfield, Mass., a platform car in a switching freight train was derailed by a blunder in making a flying switch; the body of the car was wrecked and a brakeman standing on it was fatally injured.

And 4 others on 4 roads, involving 1 passenger train and 3 freight trains.

UNFORESEEN OBSTRUCTIONS.

3d, 8 a. m., on Norfolk, Albermarle & Atlantic, at Greenwich, Va., a passenger train was derailed at a switch which had been maliciously misplaced, and the engine was overturned. Several freight cars standing on a side track were wrecked. Two trainmen were injured.

5th, on Grand Trunk, near Gilead, Me., a freight train was derailed by a landslide and the engine was overturned. The engineer and a sectionman were killed.

11th, on Chicago & Northern Pacific, at 42d street, Chicago, a train of 3 freight cars, pushed by a yard engine, was derailed by a horse and wagon at a street crossing and two trainmen were killed.

15th, on Union Pacific, near Weber, Utah, a freight train was derailed by a landslide, wrecking the engine. The fireman was killed. There was a watchman at or near this point, but he had gone to signal trains from the opposite direction.

16th, on Northern Central, at Emigsville, Pa., a freight train ran over a misplaced switch and into a side track, at the end of which it ran into the ditch, and 6 cars were wrecked. A brakeman was injured. It is said that the switch had been maliciously misplaced and the broken lock carried some distance away.

19th, on Burlington & Missouri River, near Yuma, Col., a passenger train was derailed by running into a sand drift and the engine and first car were ditched. The engineer and fireman were injured.

19th, on Cincinnati, Saginaw & Mackinaw, near Foster's, Mich., the two rear cars of a passenger train were derailed by a coupling pin which had been laid upon the track.

25th, 2 a. m., on Houston & Texas Central, at Van Alstyne, Tex., a freight train was derailed by a sleeper lying across the rail and the engine and 2 cars were overturned. The engineer was injured.

And 2 others, involving 2 freight trains.

UNEXPLAINED.

2d, on Pittsburgh, Shenango & Lake Erie, near Greenville, Pa., a work train was derailed and a pile driver car fell into the river. One trainman was killed.

6th, on Chicago & Northwestern, near Lake Benton,

the tender. A brakeman was killed and 2 passengers fatally injured.

13th, on Pennsylvania road, at Falmouth, Pa., an engine running backward drawing a caboose, running at high

distance freight was carried was 831.9 miles, or 9.5 miles more than in 1892.

The average charge for carriage was brought down to

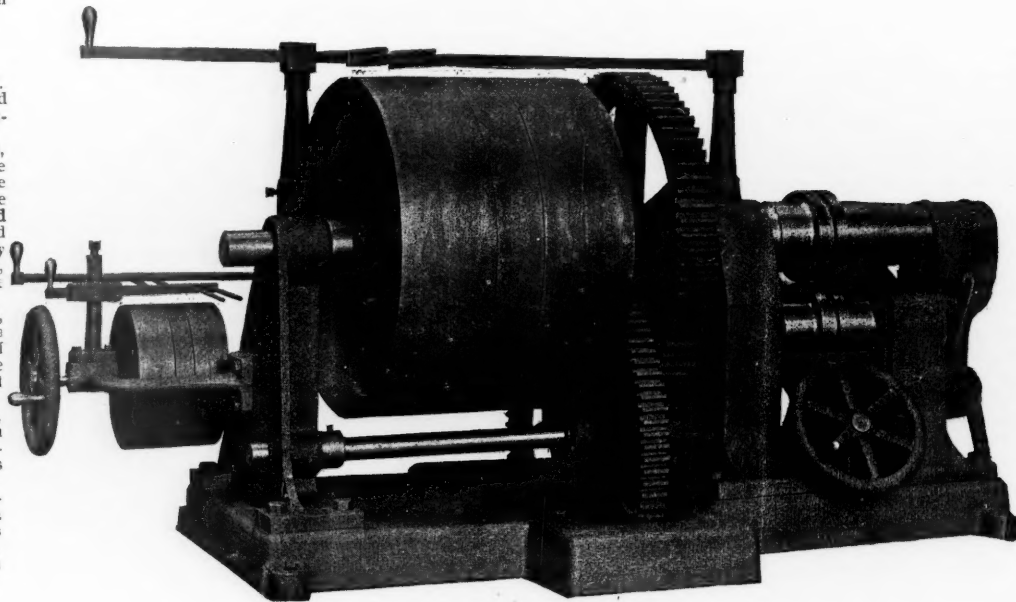


Fig. 2.—Boies Retaining Ring Rolls.

speed, jumped the track, making a bad wreck. Two trainmen in the caboose were injured.

14th, on Union Pacific, near Hilliard, Wyo., a mail train was derailed and the engine fell down a bank. The engineer and fireman were killed.

20th, 4 a. m., on Michigan Central, at Vassar, Mich., a freight train was derailed and three men stealing rides were killed.

And 10 others on 10 roads, involving 1 passenger train and 9 freight and other trains.

OTHER ACCIDENTS.

10th, on Philadelphia, Wilmington & Baltimore, at Northeast, Md., a door of a car in a freight train fell off and struck the cab of the engine of a passenger train, passing on the adjoining track, tearing off one side of it and injuring the fireman.

18th, on Lake Shore & Michigan Southern, at Dunlap's, Ind., a passenger train running at high speed was damaged by striking the caboose of a freight train on a side track which did not fully clear the main track. The cab of the engine, the buffet car and the dining car were stove in. The engineer was injured in the wreck and the fireman was injured by jumping off.

18th, on Baltimore & Ohio, at Hamler, O., a passenger train running at high speed was badly damaged by freight cars on a side track which did not fully clear the main track. The sides of several passenger cars were broken and some passengers were injured.

And 2 others, involving 1 passenger train and 1 freight. A summary will be found in another column.

Traffic of St. Mary's Falls Canal.

General Poe's report of the traffic on this canal for the season of 1893 was sent to the House by the Secretary of War on the 17th inst., and was ordered printed.

1.1 mills. The cost of carriage, etc., for seven years, is given below:

	Total cost of transportation.	Average distance carried. Miles.	Cost per ton per mile in mills.
1887 . . .	\$10,075,153.13	811.4	2.3
1888 . . .	7,883,077.40	806.9	1.5
1889 . . .	8,634,246.63	790.4	1.5
1890 . . .	9,472,214.90	797.2	1.3
1891 . . .	9,849,022.81	820.4	1.35
1892 . . .	12,072,850.88	822.4	1.31
1893 . . .	9,957,483.11	831.9	1.1

The ton mileage for 1893 was 8,980,310,240. The value of the goods transported on the basis of values adopted in 1885, except as to flour, wheat and grain, which were re-valued in 1892, was \$145,436,957 for 1893, as compared with \$135,117,267 in 1892, and \$79,331,758 in 1887. From which it will be seen that while in 1887 about 12.74 per cent. of the value was paid for transportation last year, the cost of transportation was only 6.84 per cent. of the value. Mr. Wheeler, the superintendent of the canal, has said that fully one-half of the freight carried through the canal would not sell on the docks to which it is billed for enough to pay the average railroad freight for the same distance. On the basis of the average freight rates in the United States for 1892, as returned in Poor's Manual, viz. 9.67 mills per ton-mile, the charges on the freight passing through the "Soo" Canal would have amounted to \$86,839,600, if such freight had been of the average classification. This is 59.71 per cent. of the value as estimated by General Poe, which is probably too high. But allowing for the difference in classification and the over-valuation, these figures show that Superintendent Wheeler was probably correct in his statement that half the goods seeking market by the canal could not have been sold for the railroad freight for the same distance. Nearly all of these freights, however, contribute directly to railroad freightage both before and after their voyage on the lakes, and most of them were handled again by the railroads as finished products.

While the tonnage carried decreased 2.73 per cent., the value of the freight increased 7.63 per cent. The passengers carried fell off from 25,896 to 18,869. The Canadian freight was 4.1 per cent. of the total traffic. Of the vessels passing through the canal 14 propellers carried 3,000 tons each and upwards, averaging 3,282 tons, one carrying 3,686 tons. The greatest number of miles run is to the credit of the propeller Matoa of the Minnesota Steamship line, which made 42,939 during the season, or 196 miles for every day the canal was open. The greatest ton-mileage was made by the Mariposa, viz.: 73,086,136 ton miles.

Special Car Wheel Machinery.

The cuts shown with this are from photographs of two special machines for steel-tired car-wheel work. In Fig. 1 is shown a special lathe for turning and boring steel plates of built-up car-wheels. It is designed for boring and turning steel plates, to be fitted over the hubs and into the tire of steel-tired car-wheels. The machine is fitted with two self-acting compound rests on the carriage for the purpose of turning the outer edge or rim of the plates. The feeds to the compound rests are automatic in both directions. While the above operation is in progress, the boring-bar, which is revolved by gearing from the back of the lathe, bores out the center opening, and by a reversal of the self-acting feed, faces the edge of the plate around the center opening. The boring-bar and carriage are provided with a quick hand movement. The driving cone has four steps for four-inch belt, and is powerfully geared to face-plate and boring-bar. All of the hand movements are operated from convenient positions from the front side of the machine. The completeness of this machine makes it a very desirable tool for the work. It

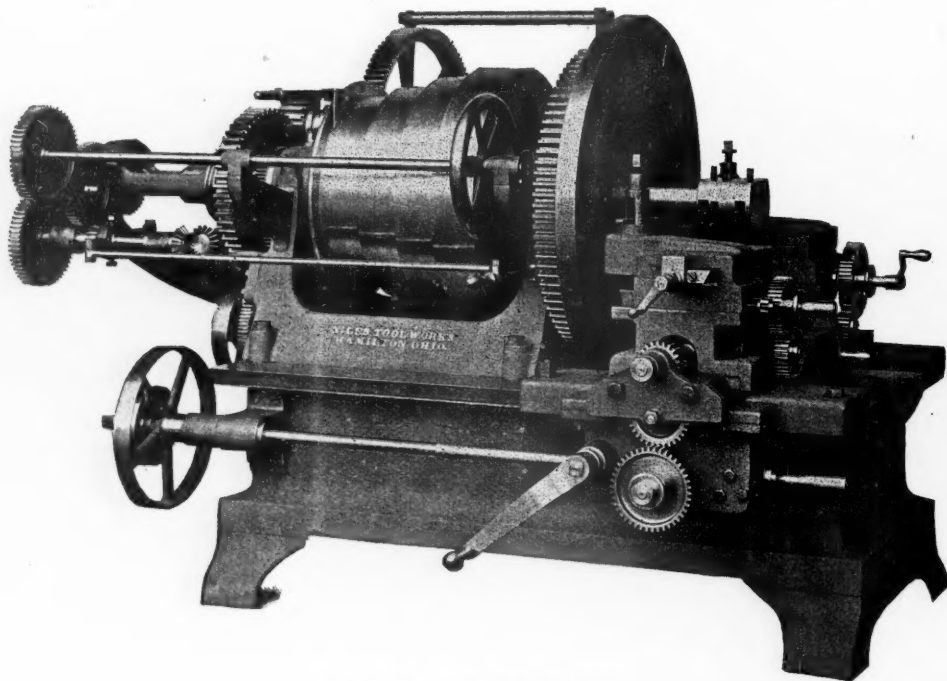


Fig. 1.—Plate Lathe for Car Wheels.

Minn., a passenger train was derailed and the engineer killed.

9th, on Lake Erie & Western, near Tyner City, Ind., a passenger train was derailed and the first two cars fell down a bank and were overturned. Fire started in the smoking car but was extinguished by water brought from

The canal was opened to navigation 219 days, as compared with 233 days in 1892. The total freight carried was 10,796,572 tons of 2,000 lbs., and 39,335 tons of this was carried in unregistered craft. During 1892 the total amount carried was 11,214,333 short tons. The average

will work plates for all sizes of car wheels, up to and including 42 inches in diameter.

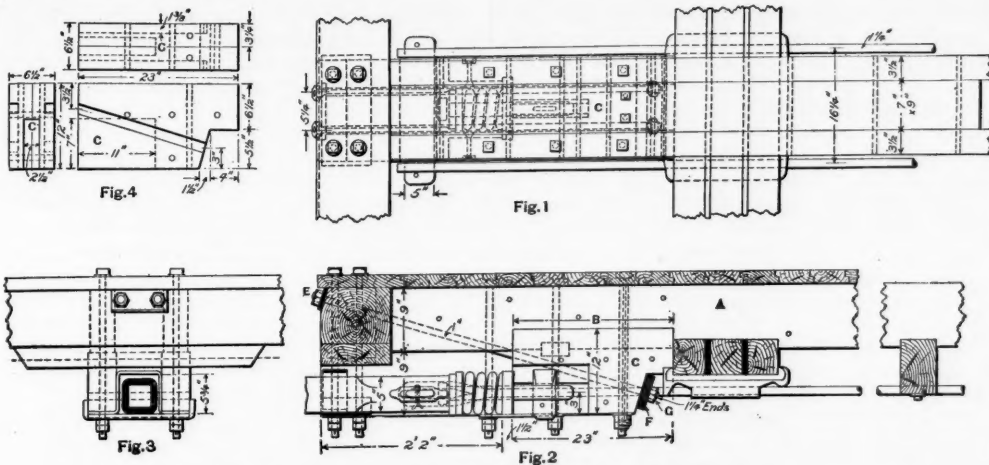
Rolls for bending retaining rings for steel-tired car wheels are shown in Fig. 2. The machine consists of housings, driving train, two steel feed-rolls and one bending roll. The steel feed-rolls, which are placed one above the other, are grooved to receive the bar intended to be rolled. The bar is gripped between the rolls by the lower roll being forced against it by means of the hand wheel. The upper roll rests in fixed bearings and is driven by the gearing. The back or bending roll is placed behind the feed-rolls, and is moved up and down by power by means of the small pulleys on the left of the cut; it bears against the bar and bends the bar to the required circle. When the ring is completed, the feed-roll is lowered, the hinged bearing on the outer end of the upper roll is dropped, and the ring is slipped over the end.

These two machines have recently been brought out by the Niles Tool Works Co., of Hamilton, O.

An Improved Arrangement of Draw Timbers.

Herewith is shown an arrangement of draft gear lately introduced on the Baltimore & Ohio, and designed and patented by Messrs. E. W. Grieves and F. J. Cole of that road.

The improvement consists in strengthening the draw tim-



New Arrangement of Draw Timbers, Baltimore & Ohio Railroad.

bers by means of diagonal truss rods extending from the rear of the same to the end sill of car. In the ordinary construction of freight cars, the center of drawbar is located at some distance below the longitudinal framing timbers. The drawbar timbers are secured to the sills by bolts passing through the sills and timbers, extending to the cross body bolster. No provision is usually made to resist concussion but the backing afforded by the body bolster and the resistance of the bolts themselves.

A very large percentage of the repairs to freight cars is on the drawbar rigging. The concussion due to rough usage under ordinary and extraordinary handling, is borne entirely by the drawbar timbers, for which purpose they are poorly adapted. This new arrangement consists of center timber A located between the two center sills of car, with notch B and blocks C fitting up into the recess. These blocks are bolted through and through to the drawbar timbers by horizontal bolts. A heavy washer F is placed at the back of the said blocks C and the drawbar timbers through which the diagonal truss rods E G pass, secured at the front end of the end sill at the point E. The shocks received on the drawhead are transferred through the springs and follower plates to the block C, and thence to the washer F, and through the diagonal truss rods to the end sill, which is unquestionably the strongest part of the car to resist the pressure. The rigging, as shown, is applied to the American type of the Continuous Drawbar, although it can be readily used with other drawbar riggings.

A City Tax on Street Railroad Earnings.

BY J. C. RANSOM.

The manner in which the city of Baltimore taxes the street railroad companies for the maintenance of its parks is an interesting chapter in the history of street railroads. The purchase of the Druid Hill Park site and the project of building a street railroad along Baltimore street came up together in 1859. Mayor Swann and those associated with him at that time in the city government seem to have been gifted with a sort of prophetic insight, and they foresaw that the granting of street railroad franchises and taxing them roundly would afford the city a never-failing revenue with which to purchase its parks and improve them. Consequently in the ordinance signed March 28, 1859, granting to William H. Travers and others the privilege of building a passenger railroad in Baltimore, one-fifth of the gross receipts of the corporation was reserved as a franchise tax, to be paid quarterly to the City Register. The treasurer of the corporation was enjoined to make a sworn statement that the accounting was right, and returns had to be made ten days after the end of each quarter, under penalty of \$100 a day for neglect of payment. This rule, modified by later legislation and subject

to constant protest on the part of the railroad companies, is still in vogue, and within the period from 1859 to the end of 1893 yielded something over \$4,000,000 to the city.

The first payments of this franchise tax were made in 1860, \$32,909 being the amount returned. That was the smallest sum ever paid by the street railroad companies of Baltimore. The following year it had increased by \$10,000, and gradually mounted to 1871, when it was \$103,674. The following year it fell back to \$87,726, but increased again in 1874 to \$192,064. That was the largest amount collected from the companies until 1891, after the partial introduction of rapid transit, when the tax was \$194,848, and in 1893 it had increased to \$212,924. There is a fair prospect that when all the lines of the city have been fitted for "rapid transit" this sum will be multiplied by two, and there is every probability that in the years to come it will constantly increase, as it has in the years past, until the companies will be paying into the Park Tax Fund more than a quarter of a million dollars yearly.

The Park Tax has been something more than a thorn in the side to the Baltimore street railroad companies. They have not only protested against its payment, but have resorted to almost every expedient to which honorable men could resort to avoid it. They have made repeated efforts to reduce the tax, and with some success, but they have never been able to accomplish its abolition, and this easy mode of raising money for the public parks has

the results were so uncertain on the ground of the burdensome park tax. Every one of the old horse car companies was exceedingly solicitous about undertaking the necessary expense of improving their lines, and rapid transit was brought into Baltimore only after an agitation which amounted to a great popular uprising demanding that it should be done. Had the people of the city been content to treat the street railroads as they were treated in other cities they might have had rapid transit years before. No one can read the arguments advanced before the Legislative Committee at Annapolis last winter, presented by the counsels of the companies, without being convinced that they are struggling under a burden not easy to bear. The companies had given up the hope of abolishing the franchise tax, but they sought in simple justice to obtain temporary relief by securing a rebate on that portion of their tracks running through the lately annexed wards of the city, where the lines are long, population sparse and business small. The public protested, the Legislature succumbed and the ancient burden still rests upon the street railways.

The Storm.

Severe and widespread rain storms, extending over four days, beginning May 18, have produced serious floods in Pennsylvania, New York and throughout the Susquehanna and Delaware valleys. In Central and Western Pennsylvania the water rose higher than at any time since the great flood of 1889, when the South Fork dam gave way, and the Schuylkill at Philadelphia rose higher than before since 1869. On the morning of May 21, the Conemaugh River at Johnstown had risen so high as to submerge important sections of the town and the Pennsylvania Railroad was badly damaged. Washouts 600 ft. long were numerous east of Johnstown, and there was much damage all along as far as Altoona. At one point the water was 4 ft. deep on the track for a length of 1,800 ft. At Williamsport many million feet of logs were carried down stream. One small span of the Pennsylvania Railroad bridge at its eastern end in Montgomery was damaged, while the double-track iron bridge of the Reading and the new county iron bridge at Muncy are reported to be entirely destroyed. The bridge of the Reading cost \$150,000, and has been in use a little over four years. The main line of the Pennsylvania was inundated east of Harrisburg so that trains had to be sent by way of Columbia and York. There were many washouts on the Lewisburg and Tyrone branch of the Pennsylvania, and a number of bridges were carried away.

The railroad tracks were submerged at many places in the Schuylkill valley. The passenger station of the Baltimore & Ohio at Twenty-Fourth and Chestnut streets, Philadelphia, was submerged, and the water stood 4 ft. deep in the waiting rooms. It will be several days before the tracks at this point can be used. Through trains between New York and Baltimore had to be run around through West Philadelphia. The tracks of the New Jersey Southern and the Camden & Atlantic were damaged in Southeastern New Jersey.

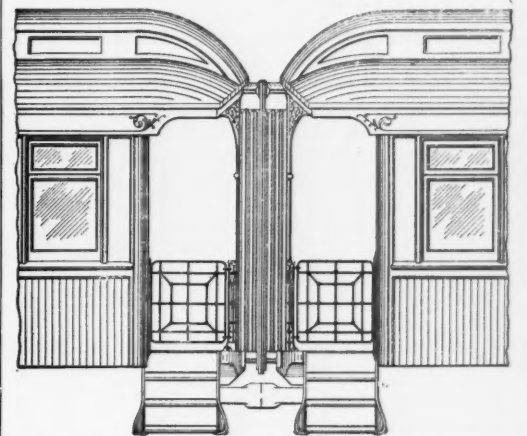
The Buffalo, Rochester & Pittsburgh, the Western New York & Pennsylvania, and the Erie roads, suffered a good deal of damage in Western New York. It is reported that a bridge undergoing repairs on the Dunkirk, Allegheny Valley & Pittsburgh near Laona, N. Y., settled 8 inches immediately after a passenger train had passed over it. The Northern Central had to suspend business in the region of Elmira, and the Fall Brook road had a number of land slides between Corning and Williamsport.

The flood of May 16, in the region of St. Paul, Minn., and Hudson, Wis., did great damage, though some accounts say that the estimate of half a million dollars is too large. One account stated that the Wisconsin Central Railroad had so many washouts on a stretch of 35 miles, near Chippewa Falls, that there was not a whole piece of track a mile long.

The storm of May 18, which caused many disasters on Lake Michigan, undermined two main tracks of the Illinois Central at Twenty-second street, Chicago.

Vestibule for Suburban Cars.

On several occasions we have suggested the idea of vestibules for suburban cars, and we observe that the Pullman Palace Car Co. has designed a vestibule for local trains which we show in the engraving. The vestibule is constructed after the same general plan and design as the regular Pullman vestibule, except that the entrance is made



wider in order to facilitate loading and unloading. Cars equipped with this feature will be better able to resist collision and heavy buffing, and will make a train much more comfortable in preventing oscillation. Though the illustration is wanting in details, it gives the essential features of the vestibule as built, its plan and mechanism being the same as were illustrated in our recent article upon vestibules, with the substitution of gates for doors



ESTABLISHED IN APRIL, 1856.
Published Every Friday.
At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

The office of the Railroad Gazette is now at 32 PARK PLACE, New York.

Perhaps the most frequently discussed paragraph of the Standard Code of Train Rules is Rule 20, prescribing the time when a new time table shall go into effect. It will be remembered that under this rule, as finally agreed upon, "all regular trains on the road running according to the preceding time table, shall, unless otherwise directed, assume the times and rights of trains of corresponding numbers on the new time table." The words which we have italicized appear in full-faced type, very black. The number of puzzles that ingenious dispatchers and conductors have invented for the purpose of picking flaws in this rule is innumerable. Whenever all other subjects of conversation lag, Rule 20 is an infallible resource. A correspondent on the Florida Central & Peninsular sends us, however, an inquiry based on an actual occurrence on that road, as follows:

On time table No. 2, of this road, northbound passenger train No. 36 (having right of track) was due at Cayce, the northern terminus, at 11.05 p.m., and arrived on time, May 12. On time table No. 3, effective at 12.01 a.m., May 13, train No. 36 is due at Cayce at 2.00 a.m. Train 35 leaves Cayce, southbound, at 1.35 a.m., and is scheduled to meet 36 at Dixiana (4.1 miles south of Cayce) at 1.49 a.m. No. 35 of May 13, left Cayce without any orders, and ran through to Savannah without orders. Should it have had an order annulling No. 36, on time table No. 3?

It would seem to be clear, under the rule, as we have quoted it, that Train No. 35 was entirely within its rights, provided the conductor and engineer had learned from the register that Train 36 had arrived at Cayce. There could be no other No. 36 for May 12, and No. 36 of May 13 was not yet due. Train 35 could not depart without searching the register for No. 36, because (if the Standard Code was in use) the latter would have the right to the road until 12 hours after its scheduled time. Perhaps, however, it would be fair for us to request our correspondent to "give us a harder one." The brain-distracting complications presented in some of the conundrums that have been propounded on Rule 20 make this question appear like mere child's play. A sample of the problems presented is printed on page 59 of the last edition of the Standard Code, and we may say that the decision of the committee on the question there presented is the answer which should be given to everyone who finds himself in doubt about the construction of Rule 20. There is no use in denying that this rule is arbitrary. There is no use in trying to make it anything else than arbitrary. It would be easy enough, by multiplying words, to make a rule which should lean the other way; but, after full and exhaustive discussion, it was decided to have it lean the way it does. Instead of trying to make the rule fit all imaginable conditions, which would be impossible with any rule, the fact should be recognized, as the committee says, that it is the plain duty of the superintendent to issue special instructions to provide for the temporary contingencies that occur when radical changes have to be made in the schedules.

The New York, Chicago & St. Louis full report shows that of its enormous gain of 200 per cent. in passenger traffic last year, seven-tenths was in through passengers. The local passenger travel (miles traveled)

increased 116 per cent.; the through, 293 per cent. The three Vanderbilt lines between Buffalo and Chicago had 287 millions of miles of through travel last year against 120 millions in 1892. The gain in through travel was very nearly as great on the Nickel Plate as on the Lake Shore, accounted for by the fact that the former was the cheap line. Its average through fare per mile was 1.25 cents, against 1.906 on the Michigan Central, and 2.006 on the Lake Shore. Its average local rate was 1.82 cents per mile, or less than the through rate on the other roads. Though the Nickel Plate had but about one-third less through travel than the Lake Shore, its through passenger earnings were 60 per cent. less. The freight of the Nickel Plate is also chiefly through—in 1892 78 per cent. of it, and last year 75 per cent. Last year its through freight decreased 18 per cent., the local freight scarcely at all. In spite of the fact that the movement in the two directions is much more unequal than on the other two lines between Buffalo and Chicago—2.7 times as much going east as west—the cost is exceptionally low, the average rate received being only 0.548 cent per ton mile for all freight, and but little more for local than for through. Working expenses were about 80 per cent. of the gross earnings. It is doubtful whether any other railroad in the country has average rates so low on both kinds of traffic; and however the expenses may be divided between them, the cost must be very low. Indeed, very few railroads can show so low cost per ton and passenger mile as the gross receipts on this road. This doubtless is largely due to the fact that the traffic is chiefly through. The average freight haul last year was 290 miles, the average passenger journey 168 miles. Even the average journey of local passengers was 89 miles, indicating that this road gets very little short-distance travel. And, indeed, the experience of all these Vanderbilt roads shows that there was a very great reduction of ordinary travel last year, due, doubtless, not only to the hard times, but to the World's Fair itself, the people who visited it giving up their ordinary summer travel on its account. It is, perhaps, more evident on the New York Central than on the lines west of Buffalo. The Central had comparatively an insignificant increase in passenger earnings during the Fair (13 per cent. against 68 per cent. on the Michigan Central), but the records of its Western connections show that it must have had a very large increase in Chicago passengers. The gain from these must have been very largely offset by the decline in other travel, which is usually very great on this road in the summer, when the enormous urban population on its lines are taking their outings. Last year they went to Chicago when they could afford to go anywhere. The whole indicates that, taking the railroad system altogether, great attractions like the World's Fair do not increase travel so much as appears from the experience at the time of the lines which lead to them most directly. There is no doubt that the Chicago Fair was a cause of less traveling during the year preceding it, of a very great reduction of ordinary pleasure travel during its existence, and of some reduction for a year afterward. Most of us can spend only about so much in luxury or amusement. If we plan to go to Europe or California one year, we economize the year before and the year afterward. The number of people who can afford to make such expenditures every year is too small to have much effect on railroad earnings, to say nothing of the fact that a shamefully large number of them travel on passes.

Pooling and the Anti-Pooling Law.

In discussing the Interstate Commerce law last week, we reminded our readers of the very general feeling that the anti-pooling law is constantly being violated. This feeling is common, and among people who believe that the railroads are the enemies of the public, it is to be expected. But it is also entertained by many who desire to be impartial. This is not surprising, either, for any one who depends for information upon the despatches in the daily papers is constantly being misled. One paper in New York, and a press bureau or something of the kind in Chicago, have constantly aimed, of late, to propagate the notion that illegal pools were being formed, that more were to be formed, and, in fact, that such pools have been secretly maintained for some time past. Many well meaning newspapers copy this stuff and treat it as news, and now we find the Philadelphia Record printing an editorial based on the suspicion aroused by these reports. It is entitled "Law Breakers Want New Laws," and goes on to say that the Committee of Congress, now considering the proposition to abolish section 5 of the Interstate Commerce Law, would do well to investigate the Trunk Line Association before recommending any law which would favor that Association. The editorial quotes

from Mr. Depew's recent speech at a Trunk Line meeting as follows:

"We entered into agreements... Those agreements have been secretly violated. The five weaker lines were given differentials supposed to be sufficient to enable them to secure their share of the traffic. If these differentials were not sufficient, greater ones were to be allowed."

The article also copies section 5 of the Interstate Commerce Law,* and it is concluded that here is a practical admission of the existence of a tonnage pool and of agreement to secure to each road its allotment.

In view of the confused notions, everywhere prevalent, as to what a pool is, it is, perhaps, to be expected that conclusions should be jumped at in this manner; but what is a pool? What does the law say? What did Mr. Depew say that showed that anyone had violated it? The Century Dictionary describes a pool as

"A combination of the interests of several otherwise competing parties, such as rival transportation lines, in which all take common ground, as regards the public, and distribute the profits of the business among themselves equally or according to special agreement. In this sense pooling is a system of reconciling conflicting interests, and of obviating ruinous competition, by which the several competing parties or companies throw their revenue into one common fund, which is then divided or redistributed among the members of the pool, on a basis of percentages or proportions previously agreed upon or determined by arbitration."

Distribution of profits is the vital point. Redistribution, after the business has been done, is an essential feature of every pool. Everything previous to that in the conduct of a pooling contract is practically ineffective without the final settlement. The definition we have quoted is based on the natural idea of a pool as the railroads learned it from common practice in other affairs, and also on the actual conduct of permanent and successful pools like the old Iowa pool and the contracts which are now common in England. In view of this, how can we call diversion of freight pooling? Diversion of freight and raising or lowering rates for the purpose of decreasing or increasing the business on one line or another, may be regarded as attempts to patch up the differences of competitors so as to get along without a pool. They are crude devices at best and never more than partially effective.

Under the present law the essentially illegal thing is the payment of money by one company to another. It is true that one road owing another \$10,000 on a pooling contract, might divert freight to that road from its own, instead of paying cash, but, in this connection, it is well to remember two points: 1, no road has done this, so far as can be learned, since the lines between Chicago and the Missouri River tried it two or three years ago and found that they could not make it work; and, 2, if it were a satisfactory method of settling pools it could be carried out, in spite of any law, by giving soliciting agents a vacation for a few weeks. It is a waste of breath to discuss a law that could be so easily evaded.

The object of a pool is to give each of two or more competitors a fixed percentage of the income arising from the total amount of business (subject to the pool), done by all the competitors. No one can tell beforehand what percentage of the business each competitor will do, and so the essential feature of a pool is the agreement to adjust irregularities afterward, say at the end of a month or of a year. To agree beforehand that A ought to have 50 per cent., B 25 and C 25, is not a pool. To agree to try to increase or diminish shipments by one line or another, is not a pool. It cannot be agreed beforehand that A, B and C shall have certain percentages of the freight or passengers; one might as well try to decide in the morning how many ounces of fine gold would be realized at night by a hundred miners, digging at a hundred different places, among ores of various degrees of richness; and so the only rational method of attaining the desired object is to provide for "evening up" afterward.

What does the law prohibit? The pooling of freight, not the pooling of passengers; it prohibits "dividing the gross or net earnings," which practically prohibits the pooling of earnings. With the section worded and punctuated as it is, good lawyers hold that this prohibition concerning earnings applies only to freight earnings; but, whether it does or does not apply to passenger earnings, there is no evidence that any railroad company has paid a single cent of its passenger earnings, or any other earnings, to a competitor since the Interstate Commerce Law was passed. Whenever statements like those printed in the New York Herald, or telegraphed from Chicago, to the effect that "the railroads have made a pool," has been brought to the attention of any officer of the roads interested it has been denied in plain terms; and there is nothing in

*It shall be unlawful for any common carrier subject to the provisions of this act to enter into any contract, agreement or combination with any other common carrier or carriers for the pooling of freights of different and competing railroads, or to divide between them the aggregate or net proceeds of the earnings of such railroads, or any portion thereof.

the attending circumstances to cast suspicion on this denial, whosoever it has been made by.

It is true that the Trunk Lines and the Chicago-St. Paul Lines, and the Chicago-Missouri River Lines have tried to equalize traffic so far as they could and not disobey the law. The Trunk Lines are commonly understood to have had in effect a passenger agreement for several years (since 1889, we believe). By common report this agreement is intended to give the New York Central 38 per cent. of the passenger business from New York to and beyond the western termini of the Trunk Lines (Buffalo), the Pennsylvania 25 per cent., etc. But this is not a pool. The fact that it would be one if money were actually paid over, to even up differences, is doubtless the basis on which the sensational reporters justify themselves in believing that they honestly tell the truth in the yarns they print, but there is no evidence that any one of the Trunk Lines has ever paid over a cent of money under this agreement. Well posted traffic officers express the belief that no money has ever been paid under it. Even if percentages have been evened up by diverting certain emigrants from one road to another, and therefore, we term the agreement a pool, it would not be unlawful; for it is clearly within the letter of the law to say that passenger pools are not prohibited unless they be money pools.

The Central Traffic Lines have recently agreed upon percentages of freight out of Chicago, and that is called a pool, but according to the statement given out by authorized officers, the agreement is simply to try to keep the percentages at the figures named. If one road, getting more freight than has been agreed upon, raises its rates or goes out of business for a few days, as the Grand Trunk has recently done on account of the shortage of coal, wherein is the law violated?

If it is answered that the devices we have mentioned may have all the effect of a pool, we reply that this is so in only a partial sense, and that the framers of the law intended to allow just this latitude. Certainly, no one can object to the principle of differential rates. It is true that many shippers prefer to see differential rates established for the purpose of making conditions unequal instead of to make them equal, but no one has discovered any way to make a law which will prevent one kind of differentials and promote the other kind, and so no one has attempted to do it. It is to be remembered that the Interstate Commerce Law deals only with legal rights. When it comes to natural rights, the right of a railroad to enter into a pool enjoys just as high standing as the right to engage in competition. We must, therefore, stick to the letter of the law, for when we come to talk about its spirit we have to give each side the right to its own opinions. People who wish to make it appear that the railroads are violating the anti-pooling law, will be obliged, in the future as in the past, to deal largely in innuendos.

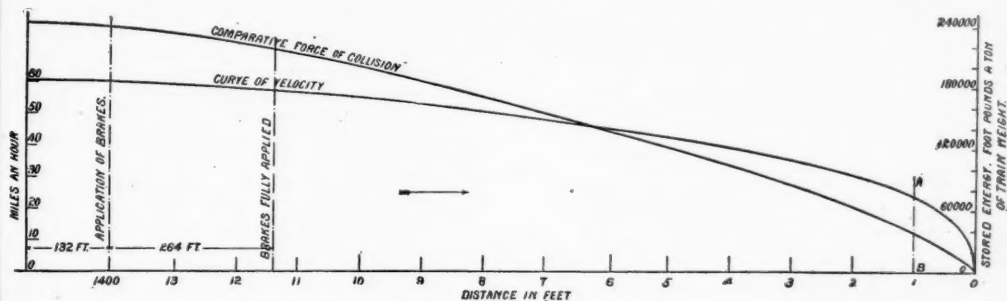
High Speed and Quick Action Brakes.

It has been said by those who should know better that the "quick action" brake is unnecessary and that the "high speed" brake is being talked of ahead of its time, but a study of what has been shown by brake trials and actual service, will show any thinking person how great is the advantage of a quick application of the brakes with great force immediately after the engineer on the locomotive becomes aware of danger ahead. At the ordinary fast speed of 60 miles an hour one second's delay means a run of 88 feet, and the 3½-second limit, allowed by the Master Car Builders' Association's proposed standard for quick action brakes, permits a run of 308 feet before the brakes are fully applied on all the cars of a 50-car freight train, and about 250 feet for a long passenger train. The "high speed" brake proposed for use on fast trains does not contemplate increasing the rapidity with which the brakes are now applied by the quick action brake, but has for its purpose an increase of brake beam pressure during the first part of the brake application when the holding power of the brake shoes is very small.

If air brakes were purchased for use during a part of the life of cars there might be good sense in using a slow acting brake for the common run of freight cars in ordinary service during the period of transition from hand to power brakes, as in the natural course of things the brakes would be renewed and at the time of renewal could be changed to quick action. But the real conditions are quite different; air brakes are purchased with the expectation that they will last at least during the life of the car on which they are put and practical experience shows that there has been little or no deterioration of the brake mechanism that gives quick action, the triple valves, since they were first put in use in 1888, and it is quite generally

believed that triple valves will be serviceable on second sets of cars after having done duty on the first. Hence business interests demand that the brakes now put on shall be of the kind that will be wanted when most trains are controlled by air brakes and high speeds are more common than now. This relates to the quick action feature only, as the time is already at hand when a reinforced or "high speed" brake is a necessity to give reasonable safety at the maximum speeds at which passenger trains are now run.

The diagram with this shows more clearly, perhaps, than can be exhibited in any other way, the advantages



to be derived from a quick action and high speed brake. The curve represents approximately the reduction in velocity of a train from 60 miles an hour to a full stop with the quick action brake. The distance is 1,532 feet from the point where the engineer sees danger ahead to the point where the train comes to a full stop.

This distance is made up of three distinct parts. First the distance run from the instant the engineer realizes danger to the time when he moves the handle of the engineer's valve to the emergency position; this time is very short, probably not more than 1½ seconds, but the distance is 132 feet at 60 miles an hour. Second, the distance run from the time of movement of the engineer's handle to the time when all the brakes are applied. With the Westinghouse brake this time is about 3 seconds, and the distance about 264 feet. The Master Car Builders' proposed standard allows 3½ seconds or 308 feet. The third part of the stop is that during which the brakes are acting on all the cars. This last distance cannot be reduced much in practice, except by using such a brake mechanism that the pressure on the brake shoes may be greater when the shoes are first applied and while the speed is high, this being the time when the shoes hold with the least force. The increased pressure on the brake shoes cannot be permitted to remain during the whole stop, as the friction would be too great and would cause the wheels to slide on the track, instead of rolling, and this would reduce the retardation of the train. It is well known that as soon as wheels begin to slide the friction is reduced and the retardation of the train is less than when the wheels revolve against the friction of the brake shoes. This undoubtedly results from the fact that the area of contact between the wheel and the rail is very much less than that between the wheel and the brake shoe. When the wheel rolls along the rail there is no sliding movement at the surface of contact and the friction is much greater than when the wheels are sliding on the rail with considerable velocity. In general the greater the speed of sliding contact the smaller is the friction, and this is the reason why in some recent trials with high speed brakes, the trains on which the wheels were so tightly held by the greater brake shoe pressure as to cause them to slide ran a longer distance before stopping.

The important point about this diagram is the exhibit of the great reduction of the force of a collision that will result from a small decrease in the length of the stop which illustrates how much it is really worth, in high speed work, to save a few feet in the length of a stop in case of danger. Let us take an example from the diagram: If a train be running at 60 miles an hour and the engineer sees an object about 1,400 feet away he can stop in time to just clear it. But if he wastes a trifle over a second, or if the brake apparatus be deficient or slow-acting even to a small degree, the length of the stop will be increased say 100 feet. Looking now at the diagram 100 feet from the end of the stop, at the point A B, it will be seen that the velocity of the train is 24 miles an hour, and an increase of 100 feet in the length of the stop may permit a collision at that speed. It is seen that even 50 feet saved is worth the effort, as it may prevent a collision at 18 miles an hour.

The curve of the comparative force of collisions at different distances from the point of full stop is instructive as it shows clearly how much the force may be reduced by a small decrease in the distance required to stop. Some of the most disastrous collisions of the

last year are reported to have occurred at speeds under 20 miles an hour, and would, according to this diagram, have been prevented by a saving of 70 feet in the length of the stop.

It will appear from this that the Master Car Builders' Association Committee has not been too severe in requiring that the quick action brake should apply fully on the rear of a fifty-car train in 3½ seconds or less, and the results of the tests on the Altoona rack indicate that, without close inspection and a positive requirement as to quick action, types of triple valves might be introduced that would permit disastrous col-

lisions under conditions where the Westinghouse quick action brake would insure safety.

Brake apparatus is a necessary auxiliary to safe train service, and although it would require less trouble and expense to maintain the hand brake, or some elementary form of compressed air brake, yet a stubborn fact confronts us, viz.: that the real conditions of actual service demand the quickest and most powerful acting practical brake, that we may have the greatest possible safety and the least final cost of operating modern railroads.

The Johnstone, Double-Bogie, Compound Locomotive.

Our readers will remember some large, double-end bogie locomotives, compounded on the Johnstone plan, that were built by the Rhode Island Locomotive Works for the Mexican Central Railroad in 1892. These engines were illustrated in the *Railroad Gazette*, March 25, 1892. At the time they attracted considerable attention owing to an entirely new plan of arranging the cylinders, rods and wheel connections. Many expected that they would not be found serviceable in practical work, but the actual trials have proved to the contrary. On the Mexican Central there are mountain sections where the curves are sharp and the grades are heavy, and fuel is so expensive that the company has returned to burning wood. Fuel is there the most important item of expense in operation, and the double-end compounds were designed to haul more cars with less fuel, and this appears to have been accomplished.

The experience in 1893 with these engines showed that they will take 12 loaded cars up a crooked, hilly section of the road, 40 miles long, using eight tons of coal, while the single bogies will take but six cars and use six tons of coal. In other words, it takes two single-end bogies to haul 12 cars up the mountain, using 12 tons of coal, or one ton per car, while the double bogie compound engines will do the same work with eight tons of coal, or two-thirds of a ton per car, giving a saving of 33 per cent. in fuel, which represents a saving of \$40 for every round trip. This justifies the use of the double bogie locomotives in the place of two separate engines, more especially as there is a further saving in the wages of engineers and firemen, who are generally Americans and are paid high wages.

When the engines were first put into service there was considerable trouble from the breaking of the rocking levers which form a part of the peculiar connection between the crossheads and the driving wheels; they were made of wrought iron, and, the forgings not being good, they would not stand up to the work. Since the wrought iron levers have been replaced by cast steel no further breakages have occurred.

Mr. F. W. Johnstone, Superintendent of Motive Power and Machinery, the designer and patentee of the engines, guaranteed their performance before they were built, and the results are better than was promised for them. It has been found that the engines will start a full train on the maximum grade, without the use of steam directly from the boiler in the low-pressure cylinders, and therefore the starting valves have been taken off and the engines always work compound. This is a sort of work that compound locomotives are especially adapted for, namely, heavy freight service. One road running out of Chicago has practically decided to use compounds on all future freight equipment, the saving due to compounding having been found to be about 20 per cent. in freight service under average conditions.

April Accidents.

Our record of train accidents in April, given in this number, includes 37 collisions, 62 derailments and 5 other accidents, a total of 104 accidents, in which 28 persons were killed and 88 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

COLLISIONS:	Rear.	But-ting.	Crossing and other.	Total.
Trains breaking in two.	8	0	0	8
Misplaced switch.	1	1	3	5
Failure to give or observe signal.	2	0	1	3
Mistake in giving or understanding orders.	0	2	0	2
Miscellaneous.	1	3	3	7
Unexplained.	5	2	5	12
Total.	17	8	12	37

DERAILMENTS:	Col-lisions.	Derail-ments.	Other acc'd'ts.	Total.
Broken rail.	1	Bad switching.	2	2
Loose or spread rail.	3	Engine left unattended.	1	1
Defective bridge.	2	Animals on track.	1	1
Defective switch.	1	Man on track.	1	1
Broken wheel.	3	Landslide.	2	2
Broken axle.	7	Sand drift.	1	1
Broken tire.	1	Washout.	1	1
Fallen brake beam.	1	Malicious obstruction.	3	3
Loose wheel.	1	Accidental obstruction.	1	1
Failure of drawbar.	5	Unexplained.	16	16
Broken car.	2			
Misplaced switch.	5			
Bad loading.	1			
Total.	37	62	5	104

OTHER ACCIDENTS:	Total.
Cars burned while running.	1
Various breakages of rolling stock.	1
Other causes.	3
Total.	5

Total number of accidents 104

A general classification shows:

	Col-lisions.	Derail-ments.	Other acc'd'ts.	Total.	p.c.
Defects of road.	0	7	0	7	7
Defects of equipment.	8	20	1	29	28
Negligence in operating.	17	9	4	30	29
Unforeseen obstructions.	0	10	0	10	9
Unexplained.	12	16	0	28	27
Total.	37	62	5	104	100

The number of trains involved is as follows:

	Col-lisions.	Derail-ments.	Other acc'd'ts.	Total.
Passenger.	13	13	4	30
Freight and other.	50	51	3	104
Total.	63	64	7	134

The casualties may be divided as follows:

	Col-lisions.	Derail-ments.	Other acc'd'ts.	Total.
KILLED:				
Employees.	1	16	0	17
Passengers.	1	2	0	3
Others.	4	4	0	8
Total.	6	22	0	28
INJURED:				
Employees.	34	22	3	59
Passengers.	16	1	3	20
Others.	6	3	0	9
Total.	56	26	6	88

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. killed.	Pass. injured.	Emp. killed.	Emp. injured.
Defects of road.	0	0	1	5
Defects of equipment.	0	1	2	6
Negligence in operating.	1	19	4	40
Unforeseen obstructions and maliciousness.	0	0	5	6
Unexplained.	2	0	5	2
Total.	3	20	17	59

Eighteen accidents caused the death of one or more persons each, and 33 caused injury, but not death, leaving 53 (51 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with April of the previous five years shows:

	1894.	1893.	1892.	1891.	1890.	1889.
Collisions.	37	72	47	67	64	36
Derailments.	62	92	86	108	67	52
Other accidents.	5	9	10	6	4	5
Total.	104	173	143	181	135	93
Employees killed.	17	33	30	52	13	22
Others.	11	2	9	4	2	23
Employees injured.	59	93	107	100	81	60
Others.	29	29	31	49	59	26
Passenger trains involved.	30	58	45	53	45	43
Average per day:						
Accidents.	3.47	5.77	4.77	6.03	4.50	3.10
Killed.	0.93	1.17	1.50	1.87	0.50	1.50
Injured.	2.93	4.07	4.60	4.97	4.67	2.77
Average per accident:						
Killed.	0.269	0.202	0.272	0.309	0.111	0.483
Injured.	0.846	0.705	0.972	0.823	1.037	0.924

The accident record continues light, though the total number of persons killed (28) is a little larger than was reported in the previous month. It is, however, about one-fourth less than the average number of persons killed in the month of April during the previous four years. The number of accidents is 35 per cent. less than the average in April for the last four years. The killing of tramps has come to be a regular thing in the train accident record, and the number of "others" killed in April is nearly one-third of the total. For the four months preceding April, 112 persons were killed, and 10 per cent. of these were "others," while for the same period four years ago, less than 4 per cent. of the deaths were "others."

Only two passenger-train accidents in April were of the class to which the newspapers devote detailed, whole-column accounts. These were the collision near Silver Brook, Pa., on the 15th, and the derailment near Tynner City, Ind., on the 9th. Near Northeast, Md., on the 14th, a passenger was killed by falling or being thrown to the ground as he was passing from one car to another in a train of the Philadelphia, Wilmington & Baltimore. At Memphis, on the 11th, a carload of dynamite was, according to the newspaper accounts, very badly wrecked, and the boxes were broken open, but no explosion occurred.

Six men were injured by a rear collision of hand cars

on the Great Northern, near Skykomish, Wash., on the 19th. These men appear to have been passengers who had been detained a long time in consequence of the strike on that road, and the hand cars were being run for the purpose of carrying them to their destination. The foremost car was derailed by the breaking of a wheel and the other was following it too closely.

Near New Era, Mich., on the 9th, a logging train was derailed by a fallen tree and seven employees were killed, most of them being scalded. There was a cable car collision on a steep grade in San Francisco on April 2, wrecking two cars and injuring a number of passengers.

The conference between the coal operators and the miners at Cleveland broke up without settling the strike, and the scarcity of soft coal continues. Railroads are put to much inconvenience all over the country, and engine service has been curtailed in many places, but there has not as yet been any serious disturbance of traffic for lack of locomotive fuel. Manufactories here and there have shut down, including a few large establishments, but it is not always clear whether the lack of coal is the only reason for such stoppages. The Grand Trunk Railway has taken off passenger trains on some minor branches and has suspended many hundred men from its shops, and the scarcity of coal is given as the cause for all this; but other accounts indicate that the general dullness of business, existing before the strike, is a main cause. The New York Central is said to have on hand enough soft coal to last a month. Some of its passenger engines burn hard coal, and it has borrowed some bituminous from the Buffalo, Rochester & Pittsburgh. The Pennsylvania Railroad is reported to have appropriated 2,200 carloads of coal belonging to other parties, and other roads are doing the same thing, though the reports are not made with such definiteness. At Erie, Pa., certain consignees secured a writ of replevin and thereby got possession of coal which the road tried to appropriate to its own uses. Bituminous coal is from \$4.50 to \$6 a ton in New York and Philadelphia. Large dealers have ordered coal from Nova Scotia and from Great Britain. The Berwynd-White Coal Mining Co. is said to have ordered 40,000 tons which will cost from \$4.25 to \$4.50 at Philadelphia, including the duty of 75 cents. The Pennsylvania is negotiating for wood along the line of the Philadelphia & Erie, and some yard engines are already burning wood. The Norfolk & Western, whose mines were not closed, is doing an enormous business. It is hiring locomotives from any of its neighbors that will rent them, and its crews are working night and day hauling coal. The miners in its coal fields have not gone out, 75 per cent. of them being negroes, who do not organize or affiliate with white men. At Norfolk, on Monday, 46 schooners and barges were waiting to load, and over 25,000 tons of coal were brought in by the trains in one day. In the Pocahontas field there are 3,600 miners at work, as compared with 1,500 the week before. Railroad officers in Chicago are not apprehensive that they will run short of fuel for their locomotives on account of the coal strike. While stocks in most cases are low, and what coal they are getting is much higher priced than usual, still they all claim to be receiving sufficient from Southern Illinois and West Virginia to keep their stocks good, and do not think that they will be obliged to curtail passenger service to any appreciable extent, or refuse freight. Manufacturing concerns at Chicago are not so fortunate, however, and the effects of the strike are beginning to be seriously felt there.

Governor Flower has signed the "Chamber of Commerce bill," providing for a scheme for building a rapid transit railroad in the city of New York. Under this bill the city of New York may undertake, or may aid in, the construction of the new railroad, but the matter must go to popular vote next fall. So the fact that the bill has now been signed by the Governor, does not, by any means, make it operative. Moreover, even if it is voted on favorably by the citizens of New York, there will still be a chance for long delay, for there is no assurance that the rapid transit commissioners named in the bill will work more promptly and harmoniously than have the present board. Although the fact that the board will have the power to involve the city's credit in the construction of the road, instead of being obliged to rely entirely upon private capital, will make a great difference in the chance of financing the enterprise.

The week has marked the beginning of the end of the New England reorganization. The plan was published April 27. Its drastic provisions, calling for a 20 per cent. assessment on the common stock without any reimbursement, gave rise to opposition, which, however, did not have sufficient following to delay the proceedings. May 21 was the last date on which securities were to be received under the plan. Up to, and inclusive of that time the following amounts were deposited: Preferred stock, \$1,561 out of the \$3,176 shares outstanding; common stock 176,054 shares, out of the 198,150 shares outstanding; second mortgage bonds, \$1,502,000 out of the \$5,000,000 outstanding. At a meeting held on the 22d inst., the committee decided to extend the time for receiving deposits to May 31 inclusive. At almost the last moment the stockholders' opposition was organized under the lead of Mr. Henry Clews. It did not reach tangible results. As stated in these columns at the time the plan was published, it is just in that it puts the burden of reorganization where it belongs, on the shoulders of stockholders, who are responsible for the administration that has reduced their property to an insolvent

condition. Its effect upon insolvent stocks of other roads was very marked. It acted as a wet blanket upon values from the date of publication, April 27, up to May 22. The decline in the stock of four leading active insolvent roads, namely, Atchison, Reading, Northern Pacific and New England, during that time, averaged 4.84 per cent., while the decline in values of 12 solvent stocks, all of which were equally active, showed an average decrease of only 2.46 per cent. Moreover, this percentage in the first case represents a decline from the highest prices, while in the second instance, or that of the solvent stocks, it by no means shows a decline from the highest. The insolvent stocks dropped steadily in the interim, while the insolvent securities fell and rallied by turns.

The British Board of Trade Return of Accidents for the last calendar year shows 17 passengers and 10 employees killed, and 484 passengers and 73 employees injured in train accidents. Each of these items is about 10 per cent. smaller than for 1892. The number of passengers, employees and others killed and injured from other causes was also smaller, and the total killed and injured by accidents connected with the movement of vehicles used exclusively upon railroads, was as follows: In 1893, killed, 1,011; injured, 4,109; in 1892, killed, 1,130; injured, 4,485. Adding other accidents occurring on railroad premises, such as those to passengers about stations, men injured in freight houses and shops, etc., 1,091 persons were killed and 8,796 injured. Of persons killed while walking on the line, there were 274 (besides 86 suicides). In this country there must be thousands; there were 300 in New York State in 1891. The only train accident in which more than one person was killed, was that on the Taff Vale Railway, on Aug. 12, which was reported in the *Railroad Gazette* of Sept. 1 and Feb. 23. Of the 460 employees killed from all causes during the year, 39 were freight brakemen or conductors, 25 engineers, 13 firemen, 56 porters, 33 shunters, 10 signalmen, 36 laborers and 136 permanent way men. This last item is not very clear, for the summary in the body of the report shows only 73 killed while working on the line.

The British post-office authorities have made a report to the House of Commons, showing the number of telegrams sent free by the railroads over the Government telegraph lines in each year since 1871, the first complete year after the purchase of the telegraphs by the Government. It appears that certain roads, the most prominent of which were the Midland and the Great Northern, agreed to a limitation of the number of messages which they should be entitled to send free, and that the others made no such agreement, but we cannot see that the total number or the rate of increase is greatly different on those roads which made the agreement, from that on the others. In the 20 years shown in the report, many of the companies have increased their telegrams more than ten-fold, and some nearly twenty-fold. Some of the principal items for the year 1890 are: Great Northern, 127,607; Midland, 339,309; North British, 99,865; Great Western, 143,969; London & Northwestern, 245,858; Caledonian, 36,842. Counting back from 1890 we find that most of the roads have doubled the number of messages in from five to eight years. The Midland doubled its record in three and one-half years. The Great Western took nine years, and the London & North-western only four and one-half.

A band of 450 Coxeyites captured a Northern Pacific freight train at Heron, Idaho, last Saturday, and rode 125 miles eastward to Arlee, Mont., where they were captured by United States marshals and taken to Helena for trial. Hogan's army, with the exception of those sentenced as reported last week, were set free by the United States Court at Helena last week, 30 men being liberated each day for several days. Large numbers of the tramps who made trouble on the Union Pacific in Idaho are held at Boise for trial. Several different bands of tramps are making trouble in Utah and Western Colorado. One band of 28 were tried at Salt Lake, and sentenced to imprisonment, but for only three days. At Troy, Mont., last week, 25 tramps captured a Great Northern locomotive and rode 25 miles to Atlanta where they ran off the track, rails having been taken up by the company. Eight of the tramps were injured and all were arrested. Coxey was sentenced to 20 days' imprisonment at Washington, May 21. Bands of "Commonwealers" are reported from Fort Wayne, Toledo, Columbus, O., Frankfort, Ky., and other places, but it does not appear that they have made any special demonstrations toward the railroads.

It is reported that the conference concerning proposed amendments to the Interstate Commerce Law, which was arranged for at the Convention of State Railroad Commissioners on May 8, is to be held in Washington on June 13. The resolution provided for a committee to confer with committees from the National Board of Trade, the National Transportation Association, the Interstate Commerce Commission and the transportation interests. The members of the convention appointed were Messrs. Allen Fort, of Georgia, Walter McLaurin, of Mississippi, J. H. Paddock, of Illinois, B. B. Stevens, of North Dakota, and S. R. Billings, of Michigan.

The thirty-first cabinet which has been formed since the present French Republic began, a little less than 24 years ago, went out of office last Tuesday on a socialistic-railroad question; that is, the attitude of the Minister of

Public Works toward the Congress of Railroad Employees, which opened in Paris on that day, was the immediate cause of the fall of the Government. M. Jonnart, the Minister, ordered the chiefs of the state railroads, and advised the members of other companies, to refuse leave of absence to delegates to the Congress. The socialist members of the Chamber of Deputies objected to this, and it was on a motion introduced by one of them, designed to nullify the action of the Minister, that the ministry was defeated by a majority of 40.

NEW PUBLICATIONS.

Treatise on South American Railroads and the Great International Lines. Published under the auspices of the Ministry of Public Works of the Oriental Republic of Uruguay, for the World's Fair at Chicago. Pages, 615, with engravings and map. Montevideo: La Nacion Steam Printing Office. To be had of Bothfeld & Weygandt, 78 and 80 Broad street, New York city.

This is a valuable compendium of information regarding the railroads of the southern portion of South America, including Brazil, Uruguay, Paraguay, Argentine, Chili, Bolivia and Peru. The general plan of the work may be illustrated by the chapter on Argentine, giving an account of the development of the railroad systems in that republic, and the engineering features of each; a reprint of the railroad law *in toto*, covering the regulations for preparing projects for public works and roads, regulations relating to national (State owned) railroads, and the so-called general railroad law affecting guaranteed and unguaranteed lines. Then follow tables representing each railroad in the republic, giving gage, all stations, distances, and heights above sea level; a single table collecting the principal data concerning all lines; a table of all roads and mileage, classified according to gages; railroads under construction; tables showing capital invested in all roads, and in guaranteed and national lines separately; receipts and expenses; comparative statement of rolling stock on all lines, for four years. Still more ample details are furnished for the Uruguayan railroads, and the plates represent general types of cross sections of banks and cuttings; types of stations; bridges; sections of tunnels, and type of rail used; all beautifully executed. The map, which is drawn to a scale of 1:100,000 in four sheets, is also well done. A good index makes the work useful for reference.

A long chapter is devoted to the consideration of the prospects for an Intercontinental Railroad, which seems to have taken a firm hold on the imaginations of some of the South Americans.

But it is unfortunate that any of them should feel warranted in saying "its success is fully guaranteed by the initiative taken by the powerful and enterprising nation in whose territory there is an extent of railroads nearly equal to that of all other nations in the world." We fear that there is a slight misunderstanding among some of the South American roads as to the value of this guarantee.

TRADE CATALOGUES.

Edwin Harrington, Son & Co., Philadelphia, Pa., have recently issued a catalogue illustrating and describing the pulley blocks, cranes and travelers manufactured by them. The pamphlet is published especially for the use of electric light and power companies. It contains descriptions of chain pulley blocks from 500 to 40,000 lbs. capacity; traveling cranes having a capacity up to 20,000 lbs.; a very ingenious radial arm crane whose sweep is a circle of 40 ft. diameter; a suspended turn-table with safety stops and travelers, and the Harrington system of transverse carriers as used in the shipping department of the Westinghouse Electric & Manufacturing Co., at Newark, which consists of suspended eye-beams running transverse to the building, and a transverse eye-beam attached to a traveling crane which runs the whole length of the building. The pamphlet is concluded with a list of companies using the Harrington systems of overhead cranes and travelers.

T. R. Almond, of Brooklyn, N. Y., manufacturer of drill chucks, turret heads and quarter turn counter shafts, has recently issued circulars with descriptions of the above tools, together with testimonials from a number of well-known firms using them. The quarter turn coupling is, as its name implies, a device for transmitting power by belt or shaft at right angles, and is of simple construction, and according to the testimonials presented, it is reliable and durable. It received the John Scott medal of the Franklin Institute, and is made in three sizes, capable of transmitting from 5 to 20 H. P. The other appliances mentioned are simple in construction, and apparently well designed.

The Clayton Air Compressor Works, Havemeyer Building, New York, have just issued a circular entitled "Clayton Air Compressors and Air Receivers," which includes illustrations and descriptions of the company's duplex steam actuated, single steam actuated, belt actuated and vertical belt actuated air compressors. Each machine is illustrated and is described by a table which gives in great detail the dimensions of the parts, the capacity, weight, price, etc., of the machine. It also contains illustrations of the company's patent air governor, of a new automatic pressure relief governor and air receivers for holding compressed air.

The Fuel Economizer Company, of Matteawan, N. Y., has just issued a circular to users of steam power, in which are set forth the merits of Green's Economizer. It

contains also reports of tests showing the saving effected by its use in several cases. Especial attention is called to the superior methods adopted in the construction of the apparatus, and to its action as a water purifier, it being claimed that any sedimentary matter which may be in the water naturally settles in the economizer, and may be blown, washed or scraped out, thus keeping the heating surfaces of the boiler clean, and adding greatly to their life, steaming power and efficiency.

The Phoenix Iron Works Company, of Meadville, Pa., issues circulars descriptive of the stationary engines, boilers, etc., which it manufactures. These engines are of the Dick & Church design, and are built as single-expansion, compound and triple-expansion of various sizes, according to the requirements of the purchaser. The boilers are mainly of the horizontal tubular type, of from 10 to 165 H. P., and are all made of one sheet in circumference. The company also builds the Manning vertical tubular boiler.

Abendroth & Root Mfg. Co., of 28 Cliff street, New York, have just issued their Information Pamphlet, No. 3, containing "A Few Plain Facts Concerning Water Tube Boilers." This is a little book of 95 pages, well printed and illustrated, in which are presented the claims of the well-known Root boiler. It contains many facts of interest to all users of steam boilers.

Railroad Matters in Chicago.

Freight Traffic.—There was disappointment on the part of a good many handlers of grain and live stock, as well as railroad officers at the failure of that class of traffic over the Western group of railroads centering here to show a larger aggregate the past week than was exhibited in their reports to the Board of Trade; the total deliveries by eleven leading roads being 63,757 barrels of flour, 2,452,000 bushels of grain, 60,550 head of cattle, 135,000 hogs, 52,100 sheep, compared with 64,796 barrels of flour, 2,326,000 bushels of grain, 54,200 cattle, 107,100 hogs, and 59,148 sheep the one immediately preceding, and 103,975 barrels of flour, 4,297,000 bushels of grain, 44,387 head of cattle, 96,144 hogs, and 57,536 sheep, the week ending May 20, 1893. The failure of the grain traffic to reach the estimates was largely attributed to unsatisfactory prices, and the fact that farmers are still busy with field work. The roads also continue to suffer from loss of coal tonnage, but the opinion prevails in well informed circles that the trouble at all the large Illinois mines along the leading roads centering in Chicago will be practically over ere the end of the week just opening. Should such be the case, it will at once give the roads a large tonnage, as the demand for coal from all directions is urgent, the stock of railroad coal here being so nearly exhausted that a number of the Eastern trunk lines are reducing train service to a material extent, and officers of others say that they will soon be compelled to adopt like measures. There is considerable trouble at the Iowa mines along the lines of the Burlington, Northwestern, St. Paul & Rock Island, but the roads are all reported as getting sufficient coal for their current wants, therefore, the only loss is in the shape of tonnage.

The westward freight traffic was close up to that of the preceding week, and compared favorably with the same time last year, except on the Northwestern, St. Paul & Wisconsin Central, on which business on the Wisconsin and Minnesota divisions was materially interrupted by floods and wash-outs. It is claimed, however, that the interruption in that direction will be ended in a few days.

The following shows the deliveries of flour (bbls.) at Chicago by the leading Western railroads for the week ending May 19, and comparisons with the two preceding years:

	1894. Flour.	1893. Flour.	1892. Flour.
C. & N. West.	11,774	21,011	19,812
Ill. Cent.	150	900	140
C. R. I. & P.	15,650	5,550	4,000
C. B. & Q.	11,045	24,064	13,364
C. & Alton.	6,150	950	4,775
C. & E. Ill.	600	1,200	
C. M. & St. P.	9,900	23,870	14,450
Wabash.	2,820	900	545
C. & Grt. W.	5,668	24,030	23,446
A. T. & S. Fe.	500	1,500	98
L. N. A. & C.
Total bbls.	63,757	103,975	80,630

The deliveries of grain (bushels) received at Chicago by the leading Western railroads for the week ending May 19, and the corresponding time the two preceding years compare as follows:

	1894. Grain.	1893. Grain.	1892. Grain.
C. & N. West.	640,000	475,000	206,000
Ill. Cent.	191,000	498,000	180,000
C. R. I. & P.	293,000	26,000	317,000
C. B. & Q.	555,000	1,073,000	648,000
C. & Alton.	87,000	84,000	180,000
C. & Ill.	9,000	59,000	47,000
C. M. & St. P.	389,000	482,000	396,000
Wabash.	108,000	120,000	68,000
C. & Grt. W.	62,000	108,000	115,000
A. T. & S. Fe.	112,000	1,368,000	251,000
L. N. A. & C.	6,000	4,000	1,000
Total bush.	2,452,000	4,297,000	2,409,000

Passenger Traffic.—Although a slight increase is noted in the passenger traffic of the Western roads, it was mainly

stimulated by the annual meetings of important organizations at interior points, therefore did not indicate permanent improvement. The bulk of such business was also done at a material reduction from regular traffic figures, and as the latter are as low as they should be, there was evidently little profit to the roads at the reduction. In fact, railroad officers admit that about the only class of travel that can be regarded as profitable, is that designated as interior local business, and just at present such traffic is scarce, and the outlook for a speedy improvement not promising. Passenger agents, while energetic in their efforts to stimulate tourist and summer resort travel by offering special inducements to excursionists, state that the prospects of large results from their efforts are not assuring.

The decision of the railroad companies to establish central redemption agencies or clearing houses at all points of importance, where holders of unused tickets or portions thereof, can present them and have the cost value refunded, is regarded as a good move, as the public will soon learn that it is no longer necessary to sell their unused tickets to scalpers at a sacrifice, as a majority now do, not, however, because each road has not made it a rule to redeem its own tickets, but because very few understood that such was the case. A central agency will also relieve holders of the necessity of hunting up the offices of the lines over which the unused tickets were issued. In this connection it is proper to state that a central clearing house has for years been advocated by some of the best railroad officers in the country, both as an act of justice to the holders of tickets, and as an effectual means of starving out ticket scalpers.

Equipment and Track Improvements.—Although managers state that car and locomotive builders are soliciting orders at prices far below figures ever made before for equipment, their requirements are such as to render the placing of new orders of consequence unnecessary. The majority also signify a disposition to wait until the result of the coming small grain harvest is fully known ere they order the limited equipment they think they may possibly require. There is, however, a little more doing in track supplies, but the former caution is observed in purchases. The orders for rails so far this year by the Chicago, Burlington & Quincy, and the Chicago & Northwestern are reported at 14,000 tons each. An officer of the latter company said: "We shall go very slow. We put down 80,000 tons of new rail on old track last year, and as we have not a mile of new road under construction this year, we shall require very few rails compared with former years. We may, however, find it necessary to rebuild some bridges along the Minnesota and Wisconsin divisions, where heavy floods have injured or destroyed old structures, but they will not, I think, prove extensive."

The manager of the Chicago & Rock Island made a like statement as to the prospective wants of that line, and a disposition to buy as they discover their needs. There are, however, a good many small orders being placed for rails and other track supplies, and the aggregate will give the local mills work for some time to come.

CHICAGO, May 21.

TECHNICAL.

Manufacturing and Business.

The Fox Solid Pressed Steel Co. has removed its New York office to Room 908, Havemeyer building, corner Church and Cortlandt streets.

A charter was issued May 17, at Harrisburg, Pa., to the Pennsylvania Furnace & Casting Co., of Pittsburgh. The directors are, James Riley and Paul N. Decrette, of Pittsburgh, and George W. Flowers, of Irwin.

The Pittsburgh Steel Casting Co.'s plant has been put on single turn for the first time in the existence of the mill. The scarcity of fuel is the only reason assigned for the action.

T. Burton has been elected President and Manager, and L. C. Ohl has been elected President of the Daniels Steel Tie Co., of Youngstown, O.

The Cleveland Car Supply Co., of Cleveland, O., has been organized by William B. Bolton, S. F. Voth, J. W. Howcomb for the manufacture of railroad appliances.

The West Superior Iron & Steel Co., which has resumed work at its plant at West Superior, Wis., under the receiver, has received an order from a Western railroad company for \$40,000 worth of steel culvert pipes.

It is announced that the litigation relating to the Leach and Collin patents on track-sanding apparatus has been ended. The business will be conducted under the sole charge of Henry L. Leach, whose office is at 70 Kilby street, Boston.

The stockholders of the Lafayette Bridge Co., of Lafayette, Ind., have voted to increase the capital stock from \$30,000 to \$55,000. Additions to the plant are being made which will make the main building 50 ft. x 500 ft., with a wing 50 ft. x 150 ft.

A. T. Paige has resigned as Treasurer and General Manager of the Paige Tube Co., of Warren, O. E. B. McCrum, Jr., succeeds Mr. Paige, and Thomas J. Bray has been appointed secretary, in addition to holding the office of superintendent.

The old board of directors of the Wellman Iron & Steel Co., of Thurlow, Pa., has been re-elected. S. T. Wellman is President, and Richard Peters, Jr., Secretary.

Mr. Charles W. Melcher, of the Chas. W. Melcher Machinery Co., of St. Louis, has given up the position of

manager of that concern to take charge of the Chicago branch of the Ingersoll-Sergeant Rock Drill Co., of New York. Mr. Melcher still retains an interest in the St. Louis house, and the presidency of the company.

J. E. Griffin, formerly Secretary of the South Milwaukee Iron Co., is President of the company, which is completing the new malleable iron works at Waukesha, Wis. It is expected that the works will begin operations by June 1. John Klapinaski is Vice-President of the company, L. D. Rosenheimer is Secretary and Treasurer, and O. C. Cole is Superintendent.

The Berlin Iron Bridge Co. is running on full time, employing at present about 700 men. There are contracts on hand to keep this force employed on full time until next July. The company has recently declared its regular quarterly dividend of 1½ per cent.

The Intercolonial Railway is calling for the whole or any part of the oil required by that railroad during the year commencing July 1 next.

The directors of the Alexander Car Replacer Mfg. Co., of Scranton, Pa., are John T. Richard, J. J. Jermyn, Jno. A. Mears, all of Scranton. The present office is at 45 Corwin Bldg., Scranton, Pa.

On May 14, 4,000 men employed in the National Tube Works at McKeesport, Pa., struck for an advance of 20 per cent. in wages, which would restore the scale in force prior to Feb. 1 last, when a reduction took effect.

The Cleveland Twist Drill Co. has recently received a letter from an officer on one of the larger roads now using the twist drills made by the company, and detailing the work accomplished by the drills. They have drilled two holes in a 66 lb. steel rail, with two men, in exactly four minutes, being used in a track drill operated by hand power. They have often, he says, drilled 100 holes without being sharpened, and in one instance under his observation, 120 holes, by accurate count, were drilled without sharpening the drill.

Iron and Steel.

The Bethlehem Iron Co. has started up its steel mill at Bethlehem, Pa., after a shut-down of one month.

The Lukens Iron & Steel Co., of Coatesville, Pa., has begun preparations for the erection of two new and large open hearth steel furnaces.

The new rail mill of the Cambria Iron Co., recently put in operation, and which had been running single, started on double turn May 17. The mill is one of the most complete plants of the kind in the country, and thus far has given entire satisfaction.

New Stations and Shops.

The Baltimore & Ohio Railroad Co. has purchased ground at Benwood Junction, W. Va., and will at once begin the erection of a brick station and office building. This is the terminus of three divisions of the road.

The North Carolina Car Co., of Raleigh, N. C., will soon begin the erection of a new plant. The foundry will be 82 ft. x 172 ft., with a cupola, and the furnace and erecting shop will be 86 ft. x 120 ft.

Long Rails.

Last week, Page 356, we made a short progress report in the matter of the use of long rails. Since writing that we learn that on the Indianapolis Division of the Pennsylvania Lines West, about 1,000 tons of 85-lb. rail have been laid this spring, 33 ft. long. So far, nothing has happened to show any difficulty, either in handling or laying these rails.

Car Heating Litigation.

The Safety Car Heating & Lighting Co. sends us the following announcement: "We have been asked whether the recent litigation, in which is involved the patent of Elmore D. Cody, for a system of car heating, in any way affected this company. We, therefore, deem it advisable to state that this litigation in no way involves any of the systems of car heating sold by us, either by hot water or direct steam. Every system used by us is covered by letters patent owned by us."

The Heilman Locomotive.

The Heilman electric locomotive has been put in service on a regular train of the Western Railroad of France. It recently took a special train, composed of five coaches and a dynamometer car over a distance of 33 miles in 55 minutes. At certain portions of the line a speed of 65 miles an hour was attained. Nothing is said, however, as to the cost of working the engine as compared with the steam locomotives, nor is it stated whether or not it still requires a force of nine men to handle it.

The Wembley (Watkins) Tower.

The construction of this tower, situated in Wembley Park, Sudbury Station, London & Northwestern Railroad, is progressing, and has now reached a height of 150 ft., the level of the first platform. The long lattice girders supporting this platform have been hoisted into place, the cross bracing connecting the legs have been erected, and the floor girders put in position and riveted up. The tower, when completed, will be 1,150 ft. in height, or 150 ft. higher than the Eiffel Tower. It was begun Sept. 8, 1893, and the first iron-work was erected in the following January. The erection of the legs is carried on independently; the hoisting and placing of the columns and cross members is done by electric cranes, one being placed in each leg. These cranes, require about 120 amperes at 105 volts, and resistance coils are provided by which the crane may be started gently with a heavy load. The motor is geared with a 21 inch barrel, and the load of 8 tons is lifted by steel wire rope 1½ inches in diameter. The

cranes have three motions which may be actuated independently or together. These are lifting, slewing and raising of the gib. The estimated total weight of the tower when completed is 7,000 tons, and it is hoped to finish it by January of next year.

Uniformity in Brakes and Couplers.

The Chicago & Northwestern has given notice to all its connections that it will be necessary for it to require that all special and private passenger cars sent over its lines shall be equipped with Westinghouse quick-action, automatic airbrakes, the Westinghouse air signal and the M. C. B. type coupler, and that it will refuse to handle any special or private cars unless they are so equipped.

THE SCRAP HEAP.

Notes.

Mr. George Griffith reached London from New York at 10 o'clock on the night of May 16, having traveled around the world in 64 days, 11 hours and 20 minutes.

The Chicago & Northwestern has given notice that hereafter all special or private cars offered for hauling over its line must be equipped with the Westinghouse quick action automatic brake, Miller vertical hook coupler and Westinghouse air signal.

Representative Fielder, of New Jersey, has introduced in Congress a bill for the protection of the property of passengers in sleeping cars, by requiring companies running sleeping cars to furnish each car with a safe. He also proposes to limit the rate of fare for sleeping and parlor cars to half a cent a mile for lower berths, and for upper berths two-thirds of the charge for lower ones.

The Owensburg tunnel on the Switz City branch of the Louisville, New Albany & Chicago, caved in on May 15, and four men at work in it were injured, three of them fatally.

A fire in New Haven, Conn., on May 16, destroyed 30 loaded cars of the New York, New Haven & Hartford, and part of a freight house. Total damage, about \$50,000. The fire is said to have started in a car containing naphtha.

Wichita, Kan., is another place where railroad employees are passing resolutions pledging their support to legislation favoring the railroads. The Railway Employees' Club of Kansas, which met in that city on May 15, is said to be holding its third annual session. The President of the club is Mr. L. C. Bigler, of Newton. Resolutions were adopted endorsing Mr. J. Bruce Lynch for State Treasurer.

The shops of the Seaboard Air Line at Portsmouth, Va., are to be closed and all the repair work of the company is to be done at Raleigh. Over 200 men have recently been discharged from the service of the road. The curtailment of shop work on various roads on account of the falling off in coal traffic is still going on. The action of the Grand Trunk is briefly referred to under another head. Pittsburgh papers report that the Pennsylvania has reduced its forces at the Union station in that city and that the time of the men at the Altoona shops has been reduced to 24 hours a week. The New York Central has laid off some track repair men.

The arbitrators in the Great Northern strike had to be called together a second time last week, the officers of the American Railway Union having complained because employees who had been arrested for illegal acts during the strike were not at once re-employed. The arbitrators ruled that the men under arrest "should be kept at work until proved guilty of having destroyed property of the company," which looks as though law-breakers were regarded as heroes in that region. Some idea of the extent of this strike may be gained from an item in a Seattle paper, stating that on May 10 no through freight had gone East over the Great Northern for 25 days. It appears that on the division between Spokane and Kalispell there were a number of landslides, and the section men having struck, these obstructions were not cleared up for some time after they occurred.

Railroad Accident in Salvador.

An unconfirmed dispatch from San Salvador, May 15, says that 300 persons have been killed in a railroad accident, resulting from a train running off the track.



An Early Lake Shipping Season.

Iron ore shipments from the head of Lake Superior to May 17 were 260,000 tons. A year ago not a ton had been shipped prior to May 12. Of the 25 cargoes sent out last

week by the Duluth & Iron Range road, the average tonnage was 2,136 gross, or about 2,400 net tons. This is the best average record ever made out of Lake Superior.

Heavy Logging Traffic.

The Duluth, Mississippi River & Northern road will carry during the summer some 30,000,000 ft. of logs; the Lake Superior Lumbering Co.'s railroad about 6,000,000; the Cranberry Lumber Co.'s road, 25,000,000, and other short, standard, gage logging roads in the Duluth and Upper Mississippi region, some 35,000,000 ft. more. All these logs are lumbered in summer. Four years ago the logging railroad and summer lumbering were unknown in the region.

Annual Meeting of the Gold Car Heating Co.

The annual meeting of the stockholders of the Gold Car Heating Co. was held at its office, No. 6 Bridge Street, New York, on the 8th inst., and the report of the officers showed that the business transacted during the fiscal year last past was the most extensive and of the most profitable nature of any since the company has been in existence. Considering the fact that this company has always paid 10 per cent. dividends, and in further consideration of the fact that the past year has been a bad one generally for the railroad equipment companies, this is rather surprising but quite true.

Mr. Edward E. Gold, President of the company, told the stockholders that the prospects for the coming year were excellent, for besides the regular business which would be secured during the year, and which he has no doubt will be much larger than usual, the company has already closed contracts for applying Gold's terra cotta storage system to the entire passenger equipment of two large railroads. The officers of last year were re-elected.

Pig Iron Going from Duluth to Pittsburgh.

The Minnesota Blast Furnace Co., operating a coke furnace at Duluth, at the head of Lake Superior, has sold some 2,000 tons of Bessemer pig iron to a Pittsburgh steel maker. This is a very unusual shipment, and has probably never been made before. It is owing, of course, to the coal strike.

Smart Work.

T. J. Sullivan, the new road master of Division 3 on the Boston & Albany Railroad, has beaten the yard record for track laying on the road. In one day this week he had 5¼ miles of heavy steel rails (95 lbs.) laid in the Russell yard, including three switches and frogs. Mr. Sullivan is receiving many compliments for his efficient work.—*Springfield Republican*.

Subjects for Local Freight Agents to Discuss.

A long list of topics for discussion at the seventh annual convention of the National Association of Local Freight Agents' Associations, to be held June 12, has been published. Among them are the following: What is the best method of making collections from parties to whom credit for freight charges is extended? What is the best refrigerator car now in use for transporting perishable freight? What action should be taken by the delivering agent on shipments billed to care of a connecting line, when such shipments are refused on account of defects to the car, and such car cannot be repaired under load, and the shipment will not permit of transfer? If a competitive line will accept the car and run it, is the delivering agent justified in diverting the freight?

What is the proper method of basing station expenses, revenue, tonnage or number of consignments handled? Where does responsibility of delivering line end and receiving line begin where cars are placed on "Y" connection, where there is no representative present to give or take receipts? Should not a switching charge be made for the extra service performed in switching appealed grain to appealed tracks? Is any extra time to be allowed for the disposal of grain switched to appealed tracks? Should it not be discontinued?

Best method of collecting switching revenue. Uniform switching cards. The legitimate use of tracers. What constitutes a delivery by a consignor to a railroad company and by a railroad company to a consignee of package or warehouse freight, handled by the owner's vehicle?

In delivering less than car load freight from freight house, consisting of heavy articles requiring two or more men to handle, where does the responsibility of the railroad company cease? Does it end when the freight is placed upon delivery platform, or when it is safely loaded on dray? Should the railroad company furnish help to transfer such freight from platform to dray?

Is it practicable to require charges for all local switching to be prepaid? The identification of original bills of lading on shipments billed to order notify. Can we not adopt a uniform size of invoice or shipping order as furnished by the railroad companies? Notation on way bills as to time and date stock was last watered and fed. What freight is exempt from car service (demurrage)? What better system of manifesting freight than that now in use could be adopted and made universal?

A Russian Inspection Velocipede.

The engraving shows a velocipede designed for inspection of Russian railroads, the chief interest in which, perhaps, is the imposing array of policemen and the commanding air of the gentleman who rides the wheel. This machine is designed to be worked by a hand lever as well as by pedals. The photograph from which the engraving was made is supposed to have been taken near Moscow shortly before the passage of an Imperial train, and it is assumed that the policemen are ready to guarantee the safety of the Czar.

Some Whys.

Why do not the new passenger cars on the Pennsylvania and other lines have mirrors in them? They are needed rather more by women in the ordinary cars than in the Pullmans.

Why are not seats provided with a place where rubbers can be put, instead of being left to kick around under the seat, and get out of reach?

Why cannot the back of the next seat have a little catch or pocket in which a passenger can put his ticket for the conductor to see and take up?

Why are not the news stands in the Broad and Twelfth street stations required to keep paper, envelopes and stamps?—*Philadelphia Record*.

Taxing the Mobile & Ohio in Tennessee.

The United States Supreme Court has decided that the State of Tennessee cannot collect taxes from the Mobile & Ohio Railroad under the terms of its existing charter,

reversing a judgment of the Tennessee Supreme Court which upheld the Tennessee law which the officials of that State have contended authorized them to tax the property of the Mobile & Ohio Co. for the years 1885 to 1889 inclusive. Justice Jackson, who writes the opinion, holds the law to be invalid as far as that company is concerned. The company's charter from Tennessee, granted in 1848, has a provision exempting its capital stock from taxation and its property for a period of 25 years from its completion, and another that no tax should be levied which would reduce the dividend below 8 per cent. per annum. The State Supreme Court decided that the taxes for 1885 and 1886 could not be collected because they were within the period of 25 years subsequent to completion, but that for the subsequent years the taxes were properly laid and should be collected. The railroad company appealed on the ground of violation of contract, and the State officials set up want of jurisdiction by the Supreme Court of the United States. The Supreme Court held that it did have jurisdiction. As to the question, did the exemption clause in the company's charter violate the section of the Constitution of Tennessee which requires all property to be taxed, Justice Jackson said the Legislature had power to exempt the property under consideration. The 8 per cent. provision constituted a contract between the corporation and the State which the law in question contravened.

The judgment of the Supreme Court of Tennessee was, therefore, reversed. Chief Justice Fuller dissented, and said that the 8 per cent provision was a rule of taxation which was special and exclusive and in violation of the Constitution of the State. Justices Gray, Brewer and Shiras joined the Chief Justice in his dissent.

Land Damages on the Chicago Elevated Roads.

In the condemnation suit of the Metropolitan Elevated Railroad Co., for the tunnel property between Canal and Clinton streets, Chicago, owned by the West Chicago Street Railroad, comprising 99 ft. of frontage on both streets, with a depth through of 320 ft., the West Chicago Co. has been awarded \$204,236. On the west side of Clinton street the jury awarded Mr. Yerkes \$103,000 for his property. Witnesses in behalf of the West Chicago Co. and Mr. Yerkes estimated the value of the property in question at over \$600,000. The railroad company considered \$300,000 a fair price for the property and had offered that amount for it. The work of extending the line from Clinton street to the river, a distance of about half a mile, will now be rapidly pushed.

Electric Freight Railroad at New Haven.

An electric freight railroad is to be built in New Haven Conn., to accommodate the factories on River street, among which are The Bigelow Boiler Co., The National Pipe Bending Co., and The Quinnipiac Brewery. The road will be about one and one-half miles long extending from Front street through River street to the Quinnipiac River, which is to be crossed by a ferry to Belle Dock, the freight yard of the New York, New Haven & Hartford road. The company has been organized as the Manufacturers' Freight Railroad, the officers being: President, G. S. Barnum; Vice-President, N. W. Kendall; Secretary, F. L. Bigelow; Treasurer, S. J. Fox. Work will be commenced at once, and it is expected that the road will be in operation by the middle of the summer. Standard railroad freight cars will be hauled by freight motors, like those elsewhere used for hauling freight. Power is to be rented of The New Haven Street Railway Co. The road will be single track. The charter was obtained last winter. The law allows two cars to a train, at a speed not exceeding six miles an hour. The factories on River street are two or three miles from the railroad station, and the expense of carting is now considerable.

What the Alton Bridge Means.

We chronicled the other day the opening, on May 1, of the bridge over the Mississippi at Alton. A description of the bridge and of its relations to the world, may be found in our issue of Dec. 15, 1893. It appears, however, that it has a deeper purpose than we had suspected, as is seen in the following from a St. Louis paper:

"Monopoly's bands, which have for so many years held St. Louis' commerce to limits narrower than its great, expansive spirit could much longer endure, are being removed, and this grand old city, with the wisdom of age and the buoyancy of never-failing youth, is now in a fair way to bound to that prosperity and progress which its inherent strength and integrity demand. Events are so shaping themselves as to lend renewed encouragement to the long-cherished hope that some day this big town, with a population of over a half million busy, tireless, enterprising people, will be the master instead of the servile puppet of the gigantic transportation monopolies which have fastened their fangs in the throat of industry and have batted off enterprise with which they have had little to do in energizing."

A Legislative Incident in Ohio.

Columbus, O., May 16.—When the Iden bill, requiring sleeping cars to carry a ladder for each section, was reached on the calendar yesterday, Senator Iden created a sensation by making the statement that he had innocently been made a party to a blackmailing scheme. He said the bill had emanated from J. and A. Plant, of Cincinnati, who have a patent ladder for this purpose, which they have been trying to compel the Pullman Co. to purchase. The Senator read a number of letters received by George M. Pullman, in one of which the writer said he proposed to go into the Legislatures and get legislation that would bring Pullman to time. Senator Iden said he washed his hands of the bill, and, on his motion, it was indefinitely postponed.—*Press Despatch.*

South American Notes.

The Coquimbo Railway (Chilian) also reports an increase of receipts from \$231,369 in the latter half of 1892, to \$255,383 in the last six months of 1893. The net profits, after meeting all charges, amount to \$53,507.

The Brazilian Imperial Central Bahia Railroad Co. reports freight receipts for 1893 amounting to \$468,581, being an increase of \$188,232 over the receipts for 1892. The expenditures consumed \$398,034 of the gross income.

A steady and remarkable growth is shown by the report of the Western Railway of Santa Fe (Argentine), the gross earnings having been in 1890, \$675,000; in 1892, \$930,000; in 1893, \$1,600,000. The net earnings have shown a corresponding gain, ending with \$754,000 in 1893.

The Carrizal & Cerro Blanco Railroad (Chilian), 50 miles in length, reports gross earnings during the last six months of 1893 of \$221,991, an increase of \$51,588 over the corresponding period of 1892. The operating expenses were reduced from 50.34 per cent. to 46.65 per cent.

The total receipt of the Tongoy (Chilian) Railroad for 1893 amounted to \$46,347, as against \$39,203 in 1892, on 34 miles of track. The net profits were \$19,411, most of which was consumed in repairs of the damage sustained by the line during the last revolution. The company is pressing damage claims amounting to \$161,000 against the Chilian Government.

The Argentine Great Western Railway makes a gloomy showing in the midst of a growing traffic on most other Argentine lines. The net receipts for the last fiscal year were only \$255,000, a sum totally inadequate to meet the charges on its debt of \$13,500,000. The failure of the government to pay its guarantee has reduced the company to the necessity of a reorganization.

The Buenos Ayres & Ensenada Port Railway shows a decrease in net receipts of \$36,284 in 1893. The gross receipts were \$651,021 on 90 miles of track, with operating expenses at 62.22 per cent. The decrease was due in part to the revolution, and in part to the quarantine against shipping in Brazil, owing to which passengers and cargoes were largely brought up to the Madero Docks in small steamers from the vessels lying at the outer roads.

The report of the Buenos Ayres Great Southern Ry Co. for the half year ending December 31, shows how little influence the last revolution exerted. The gross receipts amounted to \$2,422,565, being an increase of \$65,000 over the previous half year, but owing to a reduction in operation expenses during that period from 47.23 per cent. to 41.41 per cent., the net increase of profits distanced those of the former period by \$80,000.

The Ecuador National Railway Co. is about to send a representative to press its claims for a recognition by the Ecuadorian Congress of its rights under the so-called d'Oksza concessions of 1891. The Government claims that these concessions have been forfeited, and has taken steps for a re-survey of the extension from Chimbo to Riobamba, with the avowed purpose of letting a new contract. In addition to this conflict, dissensions seem to have arisen within the company.

Complaints are growing louder every day in Argentine over the inadequacy of the rolling stock and the terminal facilities of the railroads to meet the heavy demands of the wheat traffic. It is reported that 1,000,000 sacks of wheat are waiting for shipment along the line of the Central Argentine Railway alone. The local management of various roads is urging an increase of facilities, and it appears that the erection of a number of grain elevators will be undertaken within the present year.

An effect of the Argentine railroads on congested traffic is seen in a recent decision in Buenos Ayres, in a case against the Buenos Ayres Great Southern Railway. A shipping firm had paid, under protest, for the transportation of produce which had been delayed in transit beyond the time allowed by the Commercial Code, the maximum time being fixed by this law at one hour for each 10 kilometers of distance. The court holds the company responsible, and orders the refunding to the shippers of the total amount of freight paid.

The Sao Paulo (Brazilian) Railway Co. reports a falling off in the gross receipts for the latter half of 1893, amounting to 17 per cent. The net income, after meeting all expenses, including interest on bonds, was \$477,368 for the half year, out of which an interim dividend of 8 per cent. has been paid, leaving \$127,287 to be carried forward. The operating expenses were 61.76 per cent., being an increase over previous years, due to larger outlays on track repairs, and also in part to the high rate of exchange.

The Nitrate Railways Co., of Chili, during the year 1893 took in gross receipts amounting to \$3,102,379, from 239½ miles of track. The operating expenses were reduced from 37.99 per cent. in 1892 to 35.45 per cent. in 1893. The net income of this group of lines, after meeting all costs of operating, interest on bonds, and taxes, added to the balance brought forward, leaves the sum of \$1,645,426 applicable to dividends, out of which 20 per cent. on the common stock, and 7 per cent. on the preferred stock has been paid.

Concerning the comparatively new port of Bahia Blanca, at the southern terminus of the Buenos Ayres Great Southern system, it is stated that a lighthouse has recently been moored at the entrance to the bay, buoys indicating the channel have been renewed, the bar has been dredged, and a dredger is constantly on hand for use when needed. A steam tug is kept ready to assist sailing vessels, and ample pier facilities have been provided, supplied with hydraulic machinery for loading and discharging. Storage warehouses have been built, one for grain having a capacity of 1,700,000 bushels. Storage is given at cheap rates, and it is said that shipments through the port of Bahia Blanca can be made at less cost than through any other port in the Argentine Republic.

The Central Cordoba Railway, of Argentine, is said to be making strenuous efforts to capture the Bolivian carrying trade which now finds its way to the sea over the Antofagasta & Bolivia Railway. The distance by rail from Antofagasta to Huanchaca is 403 miles, and thence by mule to Tupiza, Bolivia, another 155 miles, with freight charges amounting to \$227.50 per ton. The distance to Tupiza from Rosario, Argentine, is 825 miles by rail, and 186 by mule, but the freight charges by this route are only \$71.10. There is also a great saving in time by the Argentine route. From Europe to Antofagasta is a journey of 45 days, and thence to Tupiza another nine days, making 54 days in all. From Europe to Rosario is only 30 days, and from Rosario to Tupiza 12 days, making a total of 42 days.

LOCOMOTIVE BUILDING.

The Missouri, Kansas & Texas is reported in the market for 10 locomotives.

The New York, New Haven & Hartford has given an order to the Rhode Island Locomotive Works for 10 passenger locomotives.

CAR BUILDING.

The Pullman Palace Car Co. has delivered to the Long Island road 40 of the 55 cars ordered by that company last year. The delivery of the balance of the order is delayed by the strike at Pullman.

The Cold Blast Transportation Co. of Kansas City, Mo., has recently placed an order for 100 refrigerator cars with the Missouri Car & Foundry Co. These cars will have the Schaeffer cast steel bolster. The same company is asking bids on 100 stock cars, 50 refrigerator cars and 50 common box cars.

BRIDGE BUILDING.

Albany, N. Y.—State Engineer and Surveyor Adams has the plans for the New York Central & Hudson River railroad bridge, which the company was authorized to construct over the basin by a law enacted by the last Legislature. The bridge will be an iron structure from Columbia street, crossing the basin diagonally, and must be constructed so as not to interfere with canal boats. Work will be started as soon as the plans are approved by the State Engineer.

Bridgeport, O.—A bill now before the Legislature authorizes this town to issue bonds to build an approach to the bridge over the Ohio River.

Burlington, Ia.—The Burlington & Mississippi River Bridge Co. has been incorporated by William H. Fitch, E. A. Landon, and H. G. Dimon, of New York, and S. Mellinger, A. H. Stutsman, James Frame, and George O. Ray, of Burlington, Ia.

Chestertown, Md.—Civil Engineer Latrobe of Baltimore, as the result of his examination of the old bridge across the Chester River at Chestertown, recommends the rebuilding of the substructure and the replacing of the old wooden superstructure with one of iron with a draw span 165 feet. He estimates the cost of the superstructure at \$9,400, and for the reconstruction of the substructure, \$8,600.

Cleveland, Cincinnati, Chicago & St. Louis.—This railroad company has recently placed orders for the iron bridges which it will erect on its system during the present year. Eighteen bridge companies competed for the work and the prices ranged as follows: For deck plate girders f. o. b. cars from 1.90 to 2.40 cents per pound. The railroad company is to do the erection work.

For through plate girders, from 1.96 to 2.40 cents per pound f. o. b. cars. The railroad company is to erect them.

For pin connected through truss bridges, 2.70 to 3.63 cents per pound, erected by the bridge company.

The Union Bridge Co. of Buffalo, N. Y., was the lowest bidder and received the award.

East Liverpool, O.—Gen. Casey, Chief of Engineers, has ordered a board of engineer officers, consisting of Lieut.-Col. Amos Stickney, Maj. D. W. Lockwood and Capt. R. L. Hoxie, to assemble at East Liverpool, O., and examine and report upon the plans of the bridge to be built across the Ohio River at that point. The bridge will cost about \$500,000 and will have a channel span of 500 ft. J. E. McDonald of East Liverpool is the local representative of the company organized to build the structure.

Easton, Pa.—Proposals for strengthening the Broad street bridge, Bethlehem, have been invited by the commissioners of Lehigh & Northampton counties. The four large cast iron columns, 50 feet high, are to be replaced by wrought iron or steel columns, and the old girders either strengthened or an additional girder provided. The cost will be borne equally by the two counties and the Lehigh Valley Traction Co.

Gettysburg, Pa.—Proposals are asked by the County Commissioners on a new bridge over Marsh Creek at Big-ham's Ford, on the line of the Cumberland and Freedom townships. The span is to be 160 ft. Bids will be opened June 12.

Indiana, Pa.—Receivers have been appointed on new bridges in Montgomery township over the north branch of Cosh Creek, and in Banks township over straight Branch Run at Cessna's mill.

Lebanon, Pa.—Councils are contemplating the erection of a new bridge over the Quittapahilla Creek at Seventh street. The old one is in a dilapidated condition.

Lincoln, Neb.—The completion of the O street viaduct at Lincoln, is now assured, the railroad companies agreeing to pay the extra amounts necessary to complete it. The contract price of the viaduct was \$115,000, but \$35,000 more will be required. The Burlington, the Union Pacific and the Rock Island are interested.

Middletown, Pa.—Plans have been submitted for a bridge at Ann street.

Montreal, Can.—The contract for the construction of the steel bridge at the Soulanges Canal has been given to the Dominion Bridge Co. of Montreal.

New Orleans, La.—City Engineer Brown has prepared specifications and plans for an iron swing bridge across the New Orleans navigation canal at the intersection of Metairie road.

Passaic, N. J.—The petition of the Passaic Park Land Co. for authority to build a bridge across the Passaic River to Passaic Park, has finally received the approval of the Bergen county freeholders, who have heretofore opposed the request of the company. The bridge cost about \$20,000, and the land company proposes to transfer the structure to the county free of cost as soon as completed.

Rochester, Pa.—Senator Quay, of Pennsylvania, has introduced a bill in the Senate, authorizing the Ohio River Bridge Co. to construct and maintain a bridge across the Ohio River at Rochester, Pa. The bridge will be for railroad and highway purposes. The bill was referred to the Senate committee on commerce.

Sioux City, Ia.—The combination Bridge Co. has been incorporated by the officers of the Credits Commutation Co. It has \$2,500,000 authorized capital and its object is to complete the unfinished bridge across the Missouri here. The officers of the company have decided to ask the city to vote a 2 per cent. tax to aid it in the construction of the bridge.

St. Louis, Mo.—The bill introduced by Congressman Forman, of Illinois, for the incorporation of a company to build a new bridge between St. Louis and East St. Louis has passed the House of Representatives, and favorable consideration is expected from the Senate.

Toledo, O.—A bill in the Legislature and passed by one house, authorizes this city, after the proposition has received a vote of the people, to issue \$200,000 in bonds to build bridges.

Warren, Pa.—On June 23, a special election will be held in Pleasant township, to vote on a proposed issue of township bonds for \$6,000 toward defraying the township's share of the expense of a free bridge across the Allegheny River, from Warren to the township.

Washington, D. C.—The Pittsburgh Bridge Co. has received an order for a 79-ft. plate girder span to be erected over Pope's Run on the Richmond & Danville Railroad.

Winnipeg, Man.—Twelve tenders have been received for the superstructure of the bridge to be erected across the Assiniboine River, as follows: For an iron structure: King Bridge Co., Cleveland, 20-ft. roadway, \$16,425; 18-ft. roadway, \$15,925; Wisconsin Bridge & Iron Co., Milwaukee, five bids ranging from \$1,200 to \$17,840; Chicago Bridge & Iron Co., 20-ft. roadway, \$13,994; 18-ft. roadway, \$13,494; Dominion Bridge Co., Montreal, first design, \$12,600; second design, \$12,240; Hamilton Bridge Co., \$15,709; Central Bridge & Engineering Co., Peterboro, Ont., 20-ft. roadway, \$10,391; 18-ft. roadway, \$10,531; Gillette-Herzog Manufacturing Co., Minneapolis, \$14,623; Detroit Bridge & Iron Co., four bids ranging from \$14,000 to \$20,000. Wood structure: W. J. Ross, \$11,999; J. W. Buchanan, \$11,375; Sharp, Thompson & Co., \$12,532; Rourke & Cass, \$10,160. The tenders have been submitted to the city engineer for report.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:
Chicago, Burlington & Quincy, \$1.25 per share, payable June 15.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Barre, annual, Barre, Vt., May 31.
Canada Atlantic, annual, Ottawa, May 29.
Canada Southern, annual, St. Thomas, June 6.
Chicago, St. Paul, Minneapolis & Omaha, annual, Hudson, Wis., June 9.
Des Moines & Fort Dodge, annual, Des Moines, Ia., June 7.
Duluth, South Shore & Atlantic, annual, Marquette, Mich., June 7.
East Barre & Chelsea, East Barre, Vt., June 4.
Great Northwest Central, annual, Ottawa, Ont., June 5.
Keokuk & Des Moines, annual, Des Moines, Ia., June 6.
Kingsdon, Smith's Falls & Ottawa, annual, Kingston, June 1.
Minneapolis, St. Paul & Sault Ste. Marie, annual, Minneapolis, Minn., June 5.
Northern, annual, Concord, N. H., May 31.
Ontario Pacific, annual, Cornwall, May 26.
St. Joseph & Grand Island, annual, Elwood, Kan., June 12.
St. Louis, Alton & Terre Haute, annual, St. Louis, Mo., June 4.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Master Car Builders' Association* will hold its annual convention at Saratoga, N. Y., beginning June 12. The hotel headquarters will be at Congress Hall, H. S. Clements, Manager.

The *Master Mechanics' Association* will hold its annual convention at Saratoga, N. Y., beginning June 18.

The *National Association of Local Freight Agents* will hold its annual convention at Pittsburgh, Pa., June 12, 13, 14. The headquarters will be at the Monongahela House.

The *Association of American Railway Accounting Officers* will hold its next annual meeting at Willard Hall, Washington, D. C., commencing May 30.

The *International Association of Car Accountants* will hold its annual convention at Old Point Comfort, Va., beginning June 19.

The *Western Railway Club* meets in the rooms of the Central Traffic Association, Monadnock Building, Chicago, on the third Tuesday in each month, at 2 p. m.

The *American Society of Mechanical Engineers* will hold its annual convention in Montreal, Can., from June 4 to 9. The headquarters will be at the Windsor Hotel. The sessions of the society will be held in the Engineering Building of McGill University.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York city, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the fourth Wednesday of January, March, April, September and October.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m. The annual convention will be held at the Cataract House, Niagara Falls, N. Y., beginning June 20.

The *Western Society of Engineers* meets on the first Wednesday in each month, at 8 p. m. The headquarters of the society are at 51 Lakeside Building, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7.30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second and fourth Tuesdays of each month except during July, August and December, when they are held on the second Tuesday only.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7.30 p. m.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday in each month, at 8 p. m.

The *Civil Engineers' Society of St. Paul* meets on the first Monday of each month.

The *Scandinavian Engineering Society of Chicago* meets in Room 309, Title and Trust Building, 100 Washington street, on the third Thursday in each month.

The *Foundrymen's Association* meets at the Manufacturers' Club, Philadelphia, Pa., on the first Wednesday in each month.

Railway Surgeons' Association.

The Association of Railway Surgeons held its annual meeting at Galveston, Tex., on May 10 and 11. Dr. L. S. Thorn, of Toledo, O., was elected President, and Dr. E. R. Lewis, Treasurer.

Western Society of Engineers.

A meeting was held at the Grand Pacific Hotel, Chicago, May 2, 62 members and guests present, President Herr in the chair. The Secretary reported action of the Board of Directors as follows: At the meeting held May 2, Messrs. Jacob B. Rohrer and Dion Geraldine were elected to membership. The applications for membership of Messrs. Chas. B. Hill and Arthur H. Lloyd were received and placed on file. Mr. Thomas Appleton resigned his position as Librarian. The resignation was accepted, and Mr. Charles J. Roney was elected Librarian to fill the vacancy.

Mr. Charles V. Weston read a paper on the New Tunnel of the West Chicago Street Railway Co., near Van Buren street. The paper was illustrated with numerous blue prints showing the construction in detail. After the reading discussion was participated in by Messrs. Casgrain, Hill, Artingstall, and Liljencrantz.

The paper and discussion were referred for publication in the Journal of the Association of Engineering Societies.

Annual Election of the Western Railway Club.

The Western Railway Club, at its annual meeting on May 15, elected the following officers for the ensuing year: President, Mr. George Gibbs, Mechanical Engineer of the Chicago, Milwaukee & St. Paul Railroad, Milwaukee, Wis.; First Vice-President, Mr. G. L. Potter, Superintendent of Motive Power of the Pittsburgh, Fort Wayne & Chicago Railroad, Fort Wayne, Ind.; Second Vice-President, Mr. D. L. Barnes, Consulting Engineer, Chicago; Member of the Executive Committee, Mr. J. D. McIlwain, Superintendent Harvey Steel Car Works, Harvey, Ill.; Secretary and Treasurer, Mr. W. D. Crossman, Aurora, Ill.

National Association of Car Service Managers.

The National Association of Car Service (Demurrage Bureau) Managers will hold its annual meeting at Old Point Comfort, Va., on June 19, and not at Louisville, Ky., as has been stated in some quarters.

The Engineers' Club of Philadelphia.

At the regular meeting, on May 5, President John C. Trautwine, Jr., in the chair, 67 members and visitors were present.

As Mr. Joseph T. Richards was unable to be present, his paper on "Rebuilding the Pennsylvania Railroad After the Johnstown Flood, 1889," was postponed, but at the call of the chair there was an interesting discussion on "Rainfall and Floods," of which the following is an abstract:

Mr. John Birkinbine: We see the volume of water flowing past Philadelphia in its two rivers, but do not consider that during the year probably four times as much rain has fallen as is represented by that flow. And the same may be said of the rivers of the earth. Professor Loomis claims that the average height of clouds is two miles. Although this is probably correct, I think there is no doubt on the other hand that many clouds from which we see rain falling are within half a mile of the surface of the earth. To make a moderate calculation, let us assume as a minimum distance 3,000 feet. If you figure it out, you will find that a rainfall of one inch in an hour, would amount to 72,600 tons of water deposited on each square mile, to elevate which 3,000 feet would mean an amount of work equal to 220,000 H. P. To raise this water in an hour by pumping engines giving a duty of 100,000,000 foot-pounds, would require the consumption of 200 gross tons of coal. I think this will help us to appreciate the immense amount of work being done by the sun in storing up our natural water supply. If the average elevation of Philadelphia is 84 feet, then we have 4,517 H. P. developed for each square mile for a rainfall run-off in an hour. When these quantities are considered, the wonder is that when we have such down-pours as that which caused the Johnstown flood, the damage is not much greater than it was on that occasion.

Mr. J. Chester Wilson: The American Society of Civil Engineers, shortly after the Johnstown disaster, published a very complete report, with illustrations, and pointed out that the excessive rainfall from the adjacent territory, as well as the bursting of the dam, was responsible for the damage that occurred.

Mr. Birkinbine: The damage at Johnstown was directly due to the breaking of the South Fork dam, but the valleys of the Juniata and the Susquehanna Rivers were seriously damaged by an absolute flood.

Mr. James Christie: I believe that, recently, Congress has made an appropriation to experiment on storing the water of the upper tributaries of the Mississippi, with a view to preventing the disastrous floods which occur along its southern banks. Mr. Birkinbine: I think that the storage work thus far done by the government has been more for the purpose of supplying water during the dry season to aid navigation between St. Louis and St. Paul. I think western irrigation might help much by water stored in large reservoirs.

Captain C. B. Dahlgren: Although we certainly have some very severe storms in this country, I concluded, after eight years passed in Mexico, that we know very little about really heavy rainfall. The rainy season there begins regularly on a certain day in June at about 1 o'clock, and the rain often comes down in sheets or "bucketfuls," as we say. The towns are built back from the streams beyond the reach of the water, which sometimes rises as much as 40 feet in an hour and a half, carrying huge boulders down in the rushing torrent.

The Secretary read a paper on the Electro-Metallurgy of Gold and Silver, prepared by Mr. A. L. Eltorhead.

American Institute of Electrical Engineers.

The tenth anniversary of the American Institute of Electrical Engineers was fittingly observed by the holding of the annual-general meeting in Philadelphia, May 15-18. The first regular meeting after the organization, was held in the Quaker City during the Electrical Exhibition in 1884.

At the annual business meeting, May 15, the result of the balloting for officers was announced. The following officers were elected in addition to those holding over: Edwin J. Houston of Philadelphia, President; William A. Anthony, of Vineland, N. J., Francis B. Crocker, of New York, and James Hamblet, of New York, Vice-Presidents; A. E. Kennelly, of Philadelphia, William D. Weaver,

Charles S. Bradley, and W. B. Vansize, of New York, Managers; George M. Phelps, of New York, Treasurer. The report of the council showed that the membership had reached 800, 180 having been elected during the past year. The Institute maintained independent quarters at the World's Fair at an expense of \$1,331, to which is attributed a large proportion of the growth in membership during the year. The recently adopted practice of holding meetings of the Western members at Chicago has proved so satisfactory that the Institute has authorized the expense of reporting them hereafter in order that the discussions thus developed may be included in the Transactions. The regular programme announced for the meeting was carried out, with the exception of two papers which were withdrawn. President Houston, who was re-elected, gave an inaugural address which was a Review of the Progress of the American Institute of Electrical Engineers.

Thursday afternoon was occupied by a steamer excursion to Cramp's shipyard, where the members were much interested in observing the quite general use of electricity in the operation of traveling cranes, portable drills, etc. The remainder of the day was occupied with a trip to Gloucester, N. J., where a planked shad dinner was served, followed by a moonlight trip up the Schuylkill River to Chestnut street wharf. The registered attendance at the meetings was 136, and the meeting room of the Engineers' Club, which threw open its house to the Institute, was well filled during every session. The paper by Mr. Wurts, on Lightning Arresters is announced to be read at Chicago, May 23.

New York Railroad Club.

The last meeting for the season of the New York Railroad Club took place on the evening of May 17. Mr. Meneely presented a paper on the subject of Roller Bearings. Four cars have been in use for some time on the Delaware & Hudson Railroad with the Meneely bearings and are reported as having given excellent results. One car is in use upon the Boston & Albany Railroad, and Mr. Adams, of that road, reported its success. The street railroads of Albany and Troy are also equipped largely with the bearing. Some of the tests reported showed a saving of 25 per cent. in fuel, 80 per cent. in lubricants and 90 per cent. in journal friction.

The discussion was opened by Mr. Forney, who brought out the point that the resistance due to journal friction constituted but a small per cent. of the total draught of a train upon the engine; that, if it were entirely absent, we should still save but a rather small per cent. of the total cost of fuel; that the roller bearing would not diminish the power required to lift a train over grades; that it did not reduce the friction and resistance of the locomotive; that it did not affect the atmospheric resistance, and that it was very doubtful if it decreased the resistance of curvature; that when these were all taken into consideration it left comparatively little for the roller bearing to save. He would be surprised, if in usual practice, it amounted to 25 per cent. of the total fuel burned. The saving in lubricants he did not doubt. Mr. Adams, of the Boston & Albany Railroad, gave briefly the results of his experience with roller bearings upon his road, and expressed the belief that they were entirely successful so far as his observations went. M. Cloud's argument pointed out the small relative importance of the journal resistance when compared with the total resistance of the train. He expressed some surprise that the saving in fuel should have amounted to so much as the tests upon the Delaware & Hudson showed. A number of members expressed the idea that while roller bearings were useful on street, trolley and suburban cars, where frequent starts and stops are made, that their economy is not where cars run long distances over average grades and curvatures.

PERSONAL.

—Mr. Nicholas S. Hill has received the appointment of Engineer to the Electrical Subway Commission of Baltimore.

—Mr. J. F. Scott, master car builder of the Evansville & Terre Haute, has resigned, and the office has been abolished.

—Mr. Robert Stevenson has been elected Commissioner of the Cincinnati & St. Louis Passenger Pool, and the Cincinnati & Cleveland Passenger Pool.

—Mr. W. H. Young has been appointed Master Mechanic of the Florida Southern road, to succeed Mr. William Rutherford, General Master Mechanic, who has resigned.

—Mr. J. F. Tucker, formerly Vice-President and General Manager of the Chicago, Fort Madison & Des Moines, has been elected Commissioner of the new Chicago-Cincinnati Passenger Pool.

—Mr. A. C. Harvey, who has resigned as General Eastern Manager of the Great Northern Railroad, in Boston, was presented with a silver service and a handsome gold-headed cane two or three days ago, by his railroad friends in Boston.

—Mr. H. S. Jarvis, the senior director and the largest stockholder of the Berlin Iron Bridge Co., died at his home at Binghamton, N. Y., on May 17. He was the father of Mr. Charles M. Jarvis, the President of the Bridge Company.

—Hon. F. A. Wilson, of Bangor, Me., was elected President of the Maine Central Railroad at a meeting of the directors at Portland last week. Mr. Wilson has served as Chairman of the company since the last annual meeting, and has been a director for some years.

—Mr. R. S. Hayes, of New York city, has been elected President of the West Side Construction Co., which is building the Metropolitan West Side Elevated Railroad in Chicago, and Mr. George C. Clarke, also of New York, has been elected Vice-President of that company. Mr. Hayes is President of the St. Paul & Duluth road, and is one of the receivers of the Central of Georgia.

—Capt. W. N. Brainard, a prominent member of the Board of Trade of Chicago, and a former vice-president of that body, died at Evanston, Ill., on May 18. Mr. Brainard was appointed Commissioner of the Illinois & Michigan Canal in 1873, and served four years. In 1883 he received the appointment of Railroad Commissioner of Illinois from Governor Hamilton, and served until 1885.

—Mr. C. M. Stanton, formerly Division Superintendent of the Ohio & Mississippi road, has been appointed General Manager of the Jacksonville, Louisville & St. Louis road, in Illinois. This road has been operated in connection with the Chicago, Peoria & St. Louis, but a few days ago, Mr. Samuel P. Wheeler was appointed a separate receiver, to operate the road. The receiver's office is at Jacksonville, Ill.

—Mr. E. W. Grieves, who has been Master Car Builder of the Baltimore & Ohio, is now Superintendent of the Car Department of that road, that office having been created

this month, and Mr. Grieves' title changed, the office of Master Car Builder being abolished. The change seems to affect the title only Mr. Grieves has had charge of the car construction and repairs since he went to the Baltimore & Ohio in 1884.

—Colonel E. T. Charlton, who has for a long time been with the East Tennessee, Virginia & Georgia, and the Queen & Crescent at Chattanooga, as joint division Passenger and Ticket Agent, has resigned from the East Tennessee, Virginia & Georgia, but remains with the Queen & Crescent, having his headquarters at Chattanooga. J. M. Sutton will represent the East Tennessee as division Passenger Agent, at Cincinnati.

—Col. Robert E. Ricker, formerly General Superintendent of the St. Louis, Iron Mountain & Southern road, died at Weeping Water, Neb., on May 17, while on his way North by the advice of his physician. Colonel Ricker retired from railroad service a year ago. He had been General Superintendent of the Iron Mountain road for five years, having gone to that road from the Denver & Rio Grande, on which he had been General Superintendent and Chief Engineer between 1884 and 1888. He was one of the oldest railroad men, and was an especially able officer, with a wide experience in construction and operation, and he was Superintendent of Motive Power on the Pennsylvania in 1866 and 1867. He dated his railroad career from 1845, and for about twenty years after that he was locating and constructing engineer on many roads in New England and the Central States. In 1861 he became Superintendent of the Terre Haute & Indianapolis, and in 1866 was in charge of the mechanical department of the Pennsylvania. He left that position to go to the Central of New Jersey, where, as Superintendent and Engineer, he was very popular. He remained with that company for ten years, and was afterward General Manager of the New York Elevated road. In 1880 he became General Manager of the Gilbert & Brush Car Works, at Troy, N. Y., resigning on his appointment as General Superintendent of the Denver & Rio Grande.

ELECTIONS AND APPOINTMENTS.

Atlantic Coast Line.—J. H. Johnson has been appointed Traveling Passenger Agent of this line, with headquarters at 300 Washington street, Boston, Mass., and will report to H. P. Clark, General Eastern Agent, at New York city.

Baltimore & Ohio.—The title of E. W. Grieves, Master Car Builder, has been changed to Superintendent of Car Department, with headquarters at Camden station, Baltimore. The duties of the Superintendent of Car Department will be same as those heretofore discharged by the Master Car Builder. The title of Walter Ancker, Supervisor of Floating Equipment, has been changed to Superintendent of Floating Equipment, with headquarters at Camden Station, Baltimore. In addition to the duties heretofore pertaining to the position of Supervisor of Floating Equipment, the Superintendent of Floating Equipment will have charge of the repair and maintenance of the company's wharf, dock, pier and bulkhead properties. He will report to the General Superintendents of the districts wherein the properties are located.

Chicago & Eastern Illinois.—W. S. Dawley has been appointed Superintendent of Maintenance of Way, vice H. F. Baldwin, resigned.

Chicago, Peoria & St. Louis.—H. F. Baldwin has been appointed Chief Engineer of this company, with headquarters at Springfield, Ill.

Cleveland, Akron & Columbus.—The traffic and passenger departments of this road have been removed from Columbus to Cleveland. The executive and auditing departments do not remove until June.

Darien & Western.—The stockholders of this company, which succeeds the Darien Short Line, have elected the following directors: W. F. Cochran, G. D. Mackey and Waldo G. Morse, of New York; R. W. Grubb, James Walker, H. S. Ravenel and G. E. Atwood, of Darien, Ga. The directors elected J. W. F. Cochran, President; G. D. Mackey, Treasurer, and W. G. Morse, Secretary.

Delaware River.—The following officers were elected at the recent meeting of stockholders at Woodbury, N. J.: President and Treasurer, William S. Connor; Secretary, Dr. S. T. Miller; Superintendent, Edward H. Green, of Penns Grove, N. J.; Auditor, George W. Reed; Directors, W. S. Connor, H. A. Du Pont, A. L. Foster, A. G. McCausland, A. E. Shuter, Alexander Justis and John S. Gerhard.

Dennison & Washita Valley.—The annual meeting was held in Denison, Tex., on May 15, and the following directors were elected: H. C. Rouse, W. B. Munson, R. C. Foster, W. S. Navins, J. T. Munson, Colgate Hoyt, C. W. Wetmore, T. C. Purdy and J. C. Field.

Eastern Railroad Association.—At the annual meeting of the Association held in Washington, D. C., the following Executive Committee and officers were elected: Executive Committee, William D. Bishop, A. A. Folsom, James Moore, Theodore N. Ely, Charles E. Pugh, H. F. Kenney, John M. Toucey, George B. Hazlehurst and Robert Neilson; officers, President, Hon. William D. Bishop, Bridgeport, Conn.; Vice-President, Theodore N. Ely, Philadelphia, Pa.; Treasurer, Albert A. Folsom, Boston, Mass.; General Counsel, Robert J. Fisher, Washington, D. C.; and Secretary, John J. Harrower, Washington, D. C.

Flint & Pere Marquette.—The following directors were elected at the annual meeting held in Saginaw, Mich., on May 16: W. W. Crapo and Louis Snow, New Bedford; J. L. Stackpole and J. Morison, Boston; Lewis Pierce, Portland, Me.; George Coppell and Thomas F. Ryan, New York; H. B. Stone, Chicago; H. C. Potter, Sr., and H. C. Potter, Jr. The only change was the election of Thomas F. Ryan, of New York, a director of the Columbus, Hocking Valley and Toledo road, to succeed J. W. Mackintosh, of Boston.

Great Northern.—G. A. Butler, who has been with the company six years as traveling Freight and Passenger Agent, and was formerly New York city Passenger Agent and Chief Clerk in the passenger department at St. Paul, has been appointed New England Agent, with office at 211 Washington street, Boston.

Missouri, Kansas & Texas.—At the annual meeting held in Parsons, Kan., on May 16, the following directors were elected: John D. Rockefeller, William Rockefeller, Henry C. Rouse, Colgate Hoyt, H. W. Poor, William Dowd, J. F. Freeman, Simon Sterne and J. H. Bond, of New York; T. C. Purdy, of St. Louis, Mo.; F. N. Finney, of Milwaukee, Wis.; B. P. McDonald, of Fort Scott, Kas.; Alfred J. Poor, of Chapman, Kas.; Lee Clark, of Parsons, and H. J. De Marez Oyens, Amsterdam, Holland. H. C. Rouse was elected President, and T. C. Purdy, Vice-President and General Manager, with other officers

as follows: Vice-President, William Dowd, New York city; Comptroller, Secretary and Treasurer, Charles G. Hedge; General Counsel, Simon Sterne; General Solicitor, James Hagerman; Local Treasurer, St. Louis, R. W. Maguire; Local Treasurer, in Kansas, J. F. Daley.

North Galveston, Houston & Kansas City.—The purchases at the recent foreclosure sale have elected the following Board of Directors: Isaac Heffron, George Seeligson, George H. Henchman, J. W. Riddell, Leon Blum, C. C. Petit, J. Morrow, George B. Crummy, and I. S. McKinney. The directors elected the following officers: George Seeligson, President; Isaac Heffron, Vice-President and General Manager; J. W. Riddell, Secretary, and George H. Henchman, Treasurer.

Omaha & St. Louis.—At the annual meeting in St. Louis, Mo., held May 15, James H. Smith, Henry W. Eaton, George G. Thompson, Cornelius B. Gold, George Warren Smith and Walter Bound were elected directors.

Overland Pacific.—Barclay Henley and J. T. Johnson, of San Francisco, with Calvin Stewart, of Fort Bragg, Cal., G. W. Hunt, of Walla Walla, Wash., and R. S. Strahan, of Portland, Ore., have filed articles of incorporation for this company in California.

Pittsburg, Fort Wayne & Chicago.—The annual meeting was held in Pittsburg, Pa., on May 16, and John N. Hutchinson, William Hooper and L. Z. Leiter, whose terms as directors expired, were re-elected.

Port Royal & Western Carolina.—The annual meeting was held in Augusta, Ga., on May 15. The only change in the Board of Directors was the election of J. P. Dougherty, of Augusta, to succeed E. R. Schneider, and J. A. Brock, of Anderson, to succeed W. W. Humphreys, deceased.

Quebec & Lake St. John.—The annual meeting was held in Quebec on May 17, and the following directors were elected: Frank Ross, E. Beaudet, S. Peters, Hon. P. Garneau, Hon. F. Langelier, John T. Ross, T. A. Piddington, Hon. George Irvine, Edwin Hanson, Montreal; Jules Tessier, Gavin Moira, S. N. Parent, mayor Quebec, ex-officio, Lawrence Stafford, representing Provincial Government.

Richmond & Danville.—W. A. Pierce, agent of the freight department, with headquarters at 228 Washington street, Boston, Mass., has been appointed New England Agent.

South Carolina & Georgia.—The annual election was held on May 12, and the following directors were elected: Charles Parsons, Gustav E. Kissel, George Parsons, Charles Parsons, Jr., William Lummis, Clarence S. Day, Walter Ferguson, Edwin Parsons, 3d, Henry Parsons, F. B. Wesson and W. H. Platt, Jr. The officers elected were Charles Parsons, President; Charles Parsons, Jr., Vice-President, and Henry Parsons, Secretary and Treasurer.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Bedford & Blair County.—The contract for building this railroad, 42 miles long, has been awarded to E. A. Tennis, of Thompsonsontown, Pa., and work has already begun. The road starts at Cessna, in Bedford County, Pa., and extends to Brooks Mills, in Blair County, 23 miles, connecting at both towns with the Pennsylvania Railroad. At Osterberg it branches off into Somerset County, a distance of 18 miles, passing through timber and coal lands, owned or controlled by a syndicate of Maine lumbermen, who are also the projectors of the railroad. Theodore Gerrish, of Portland, Me., is the largest stockholder. George B. Orlady, of Huntingdon, Pa., is President. The line between Cessna and Brooks Mills is now graded.

Baltimore & Cumberland.—The decision to change the headquarters of the engineers from Hancock, Md., where it has been located for the last year, to Clear Springs, near Hagerstown, Md., which was announced this week, is the only news relating to this railroad which has developed for some months. Bids for constructing the entire 80 miles of the surveyed line between Cumberland and Hagerstown, Md., were received in March. The directors have not announced the letting of any contract and apparently have taken no action on the bids.

Brighton Beach & Coney Island.—Mayor Schieren, of Brooklyn, has approved the resolution of the Board of Aldermen giving to the Railroad Company a franchise to extend its tracks from the terminus of the road at Atlantic and Franklin avenues to the station of the Kings County elevated road at Fulton street and Franklin avenue, a distance of nearly two city blocks.

Canadian Roads.—Application has just been made to the Dominion parliament for a charter incorporating a company to construct a road from a point on Black River in the township of Waltham to Ferguson's Point, Pontiac county Ont., thence across the Ottawa River to Petewawa, Renfrew county.

Charleston, Clendennin & Sutton.—This road, which is now in operation from Charleston, W. Va., up to Elk river 30 miles, is negotiating with New York and Pittsburg parties for extending it to Sutton, Braxton County, to a connection with the West Virginia & Pittsburg. The extension contemplated is about 100 miles in length. Governor William A. MacCorkle and a number of others interested in the road for the development its extension will bring, made a trip over the proposed route with a number of New York and Pittsburg gentlemen last week. Senator Johnson N. Camden and other West Virginia capitalists and railroad men are owners of a large part of the wild country through which the road will pass, and will give the enterprise financial assistance.

Columbus, Hocking Valley & Athens.—The Legislature has passed the bill authorizing the leasing of the Columbus & Hocking canal bank to this company for a railroad right of way from Carroll, Fairfield county, to Athens, Athens county, for \$50,000 cash and \$10,000 annual rental, E. M. Paster and G. W. Lamb, of Columbus, are incorporators.

Conestoga Valley.—Work has been suspended on the proposed line from Springfield, Chester County, to Lancaster, Pa., and the 200 workmen laid off. It was said that the line was being built as a branch of the Wilmington & Northern, but the officers of that company have denied any connection with the enterprise.

Condorsport & Port Allegany.—Thomas J. Rogers, Chief Engineer of the railroad, is running a line from Sweden Valley, in Potter County, Pa., the present terminus of the road, northeast to Ulysses, connecting with the Fall Brook road at the latter place. B. A. McClure of Condorsport, Pa., is General Superintendent.

Dakota & Eastern.—Articles of association were filed at Decatur, Ill., May 15. The company is a re-organiza-

tion of the Indianapolis, Decatur & Western, sold at foreclosure at New York on May 10, 1894, to George Sherman, of New York. The directors are R. B. F. Pierce, A. Mason, John S. Ferris and W. H. Latta, of Indianapolis; John K. Warren, William Coutten, Henry P. Page, John F. Roach, of Decatur, Ill.

Darien & Western.—The Darien Short Line, which was sold at foreclosure in 1893, has been reorganized as the Darien & Western. The new directors are W. F. Cochran, George D. McKay, and Waldo G. Morse, of New York City, and Judge James Walker, Richard W. Grubb, H. S. Ravenel and George E. Atwood, of Darien, Ga. The road is partly built between Walthourville and Darien, Ga., on the coast, and an effort is to be made to finish that road to the latter town at once.

Elk Mountain.—M. L. Beemer, Civil Engineer for the Elk Mountain Railroad, has recently arrived in Glenwood Springs, Col., and states that the company will commence work next month on the road up Crystal River.

Elkton, Massey's & Middletown.—The surveying party that was put in the field by the Pennsylvania road to survey a route for this branch road is now working between Bohemia Manor and Cecilton, Md. Several lines have already been surveyed between Chesapeake City and Middletown. South of Chesapeake City the road divides, Middletown being the terminus of one branch, and Massey the terminus of the other. W. B. Pritchard is the engineer in charge for the Pennsylvania.

Elkton & Southern.—The incorporators met in the office of John S. Wirt, at Elkton, Md., on May 18, and ordered that the subscription books be opened at Elkton on June 20. This project is an opposition line to the Elkton & Middletown branch of the Pennsylvania, now being surveyed. The proposed route is from Childs south to Elkton, Chesapeake City, St. Augustine, Cecilton, Fredericktown, Galena to Lambson's, on the Baltimore & Delaware Bay Road, a distance of 25 miles. A new survey will probably be commenced this month. The present directors are George Biddle, David P. Davis, Z. Porter Lusby, John J. Williams, George N. Bennett, John S. Wirt, W. H. Mackall, Manly Drennen, and Dr. Howard Bratton, of Elkton.

Little Rock, Hot Springs & Texas.—Uriah Lott, the projector of this road and president of the company organized to build it, has recently prepared new articles of incorporation providing for branches to most of the important towns in Arkansas, and for a line through the Indian Territory to a point on the St. Louis & San Francisco, near Wister, and to other points in the Indian Territory. The main line is to reach the towns of Little Rock, Hot Springs and Fort Smith, and he announces that the total length of the projected road, with various branches named in the new charter, will be 350 miles. Contracts have been let for part of the line from Hot Springs.

Louisiana Northern.—This is the title of a new railroad building from Logansport, Ia., of which the first five miles are now completed. The project is backed by Chicago and Kansas City capital. The construction of an additional ten miles of road is contemplated in the near future.

Metropolitan West Side Elevated.—Mr. R. S. Hayes has been elected President and Mr. George Q. Clark, Vice President of the West Side Construction Co., now building the Metropolitan West Side Elevated Railroad of Chicago. The following have been elected trustees: R. Somers Hayes, Frederic P. Olcott, Samuel Thorne, Henry L. Higginson, Charles F. Dieterich, A. F. Walcott and George C. Clark, Messrs. Thorne, Olcott and Dieterich being elected to fill vacancies.

New Roads.—Interested manufacturers at Providence, R. I., are planning the construction of a new railroad about six miles long, from Oakland Garden, near Rocky Point, to a junction with the New York & New England Railroad. The object is to secure the cheaper transportation of coal to manufacturing villages, and the erection of large coal handling facilities at the water terminus, is an important feature of the plan. The same firms are considering a six-mile connection from Primrose, on the Providence & Springfield road, controlled by the New York & New England, to Woonsocket, by which and the first mentioned line there would be a new line for coal transportation to Woonsocket. The new line is to be known as the Cowesitt Terminal & Transportation Company.

Messrs. Alderson & Co., and others, are building a five mile road from Craigsaville, Nicholas Co., W. Va., to Camden-on-Gauley, on the West Virginia & Pittsburg road, for the purpose of marketing the product of a number of large saw mills in the vicinity of Craigsaville. The road is standard gage, well built, and if there is demand for it, will conduct general railroad traffic.

A meeting of citizens was held at Whippany, N. J., last week, to agitate the question of building a railroad three miles long, from Whippany, Morris County, to Morris Plains, and connect with the Delaware, Lackawanna & Western. The following were appointed a committee to push the project through: Hon. W. R. Wilson, K. W. McEwen, W. W. Cook, J. H. Polhemus, James A. Muir, W. Mitchell, and C. M. Kitchell. Mr. J. E. Melick, Engineer and Superintendent of the Rockaway Valley Railroad, will have charge of the engineering work.

New York, Ontario & Western.—Surveys are being made for a branch of this railroad to the site of the new New York State Reformatory, in the town of New Paltz, which is to be built this summer. The construction of this road will soon be commenced.

Nova Scotia Southern.—The Board of Trade of Halifax, N. S., has adopted resolutions favoring the construction of the railroad outlined by the projectors of this company, and a committee has been appointed including H. M. Wallace and J. G. Troop, President of the Board of Trade, to visit New York and hold a conference with R. G. Hervey, of 15 Wall street, the president of the company. The railroad has been surveyed from Yarmouth to Shelburne, on the southern coast of Nova Scotia, the distance between the two points being over 90 miles. A second line called the Nova Scotia Coast Railroad is projected by A. H. Chadbourne, of New York city, over pretty much the same route. The latter line is to be a two-foot gage line, while the Nova Scotia southern is proposed as a standard gage road.

Ohio Southern.—Chief Engineer R. H. Cobb, and a party of directors of this company and those interested in the Columbus, Lima, Milwaukee Railroad, have just returned from a trip between Lima and Defiance to inspect the graded roadbed of that company built a few years ago. It is understood that negotiations are now pending for the sale of the property of that railroad to the Ohio Southern. The distance from Lima to Defiance is about 50 miles. The extension to Defiance will give the company a connection with the Baltimore & Ohio line into Chicago.

Oklahoma.—A company was incorporated under this name in Kansas last week to construct a railroad from Arkansas City, Kan., through Oklahoma to Eagle Pass, Tex. The directors are: H. Stout and L. F. Hoops, of Arkansas City, which is to be the headquarters of the company; C. M. Bay, Kingman, Kan.; S. Parker, New York city; W. N. Brayton and G. Y. O'Neal, Parker, I. T.; C. M. McClellan, Tulala, I. T.

Ottawa, Arnprior & Parry Sound.—The contract to Killaloe, Ont., is winding up, and the track from Eganville to Golden Lake has been ballasted. This part of the road will be ready for Government inspection in a few days, giving 84 miles in operation west from Ottawa. The work is well advanced in Haggerty Pass, and from that point to the 129th mile the ground has been broken. From the latter point up to the 142d mile the right of way is being cleared.

Overland Pacific.—Articles of incorporation have been filed in California, by this company. The road is to extend from a point on the Pacific Coast near Fort Bragg, in Mendocino county; thence by way of Little Lake Valley and Mount Vernon coal mines, on Eel river, to Round Valley and to the city of Ukiah. The directors are: Barclay Henley, T. L. Johnson, of San Francisco; Calvin Stewart, G. W. Hunt, of Walla Walla, Wash.; R. S. Strahan. Over \$110,000 of the capital stock has been subscribed.

Pecos Valley.—J. M. Hughes, of Fort Worth, Tex., has a contract for the construction work on the extension of this road, which is to be built from Eddy, N. M., north to Roswell, 80 miles. The road runs through a very fertile district of irrigated land, and will be completed next September.

Quincy & New Philadelphia.—Articles of incorporation have been filed in Illinois by this company, which proposes to build a railroad from Quincy northeast to New Philadelphia, a distance of 60 miles. The incorporators are: J. S. Wells, W. H. Steele, W. H. Smith, Charles Shannon and M. D. Obendhain, of Industry, Ill. W. H. Smith is President; W. H. Steele, Vice-President; M. D. Obendhain, Secretary, and Charles Shannon, Treasurer. The principal office will be at Industry, Ill.

Rio Grande Northern.—This company has recently issued a mortgage for \$360,000 on the projected line between Crispa Station, near El Paso, Tex., and the San Carlos coal mines in Texas, a distance of about 27 miles. Arrangements have been made to begin the construction of the road between these points at once, and the officers state that the contract has been awarded, but the name of the contractor has not yet been published. The construction work will be in charge of G. N. Marshall, of El Paso, Tex., chief engineer.

Roaring Creek & Charleston.—Some recent business complications between the management, contractors and people who were furnishing the money to build the above road, which caused the suspension of operations for a few weeks, have been overcome, and work has been resumed with vigor. Contractor James McDonald, of Pittsburgh, now has a force of men grading in the Roaring Creek Valley above Womelsdorf, W. Va., and expects to have the roadbed completed to that point in three weeks. Peter Cain is laying the rails from Womelsdorf south, and promises to have the track ready for the first train on May 30.

Rondout Valley.—A meeting in relation to the proposed railroad between Kingston and Ellenville, N. Y., was held at the office of the Board of Trade of the city of Kingston last week. Hon. Isaac N. Cox, ex-member of Congress and ex-Assemblyman Lounsbury spoke in relation to the amount of stock they wished the Board of Trade to subscribe. The Board of Trade seem to be adverse to assuming any heavy financial responsibility in the enterprise.

Southern Pacific.—The coast extension which has recently opened to San Luis Obispo, Cal., is to be continued south of that town at once. The contract for the extension has been let to Stone & McMurtrie, which is a reorganization of the firm of George Stone & Co., of San Francisco, which built the line into San Luis Obispo. The present contract is for the line as far as Santa Ynez via Lumboc, the route traversing Price's canyon, Grover, Oceano and Shuman canyon to Santa Ynez crossing, which is 5½ miles from the ocean. The track of the Pacific Coast Railroad will be crossed at Maxwelton, 6 miles south of San Luis Obispo.

South Pennsylvania Railroad & Mining Co.—The various tunnels along the route of the abandoned South Pennsylvania road were found by the viewers to be in a more or less bad condition. Little grading has been done between Roxbury and the eastern portal of the first tunnel, a distance of 2½ miles. This portal was in fair condition, but the roof of the tunnel was in danger of falling in at several places. Both portals of the twin tunnels, about 600 ft. apart, are in bad condition, being more than half closed in by the sloughing of the front. Some grading has been done between Kittatinny and Tuscarora tunnels. Between Burnt Cabins and Sideling Hill tunnel there are a succession of deep cuts and fills, in some places reaching 100 ft. in height.

Wiscasset & Quebec.—At the meeting of the Board of Directors at Waterville, Me., last week, several contracts were let for the work of constructing the road. The contract to build the road from Wiscasset to Burnham was let to Contractors Rowe & Hall, of Boston. The contract to build the car shops at Wiscasset was awarded to a firm in Wiscasset. Wharfage rights at Wiscasset for a terminal of the road were purchased. The grading of the road will be commenced at once by the contractors at Wiscasset and at Burnham. The contractor is to complete the grading to Pittsfield by Nov. 1, at which time the company will take possession of the Sebasticook & Moosehead railroad, which has been purchased of Judge Van Wart of St. John, N. B. The gage of the road will be changed to two feet, which is to be the gage of the new road, and operated in connection with that line it will make a continuous line from Hartland to Wiscasset. George Crosby, of Waterville, Me., is the manager, but the company's headquarters are at Wiscasset, Me.

GENERAL RAILROAD NEWS.

East Tennessee, Virginia & Georgia.—The foreclosure sale in the suit of the Central Trust Co., under the decree of the United States Circuit Court, has been fixed for July 7, at Knoxville, Tenn.

New England & New York.—T. Jefferson Coolidge, Jr., John I. Waterbury, of Boston, and others of the reorganization committee of the New York & New England road, have applied to the Massachusetts Legislature for a special charter for this company as the successor of the

New York & New England. The railroad committee of the Legislature gave a hearing to those interested in the incorporation of the company at Boston last week. Mr. Coolidge spoke in favor of granting the petition, and explained that the new charter was asked to give the reorganization committee power to purchase the property of the New York & New England under the foreclosure of the second mortgage bonds.

New York, Lake Erie & Western.—All negotiations between the so-called Harriman opposition committee and Drexel, Morgan & Co. have been broken off. The Harriman committee made a definite proposition to Drexel, Morgan & Co., which was rejected. As a result of this rejection the suit instituted by John J. Emery against the railroad company and Farmers' Loan & Trust Co., as trustee, to annul the new \$70,000,000 mortgage will be pushed.

South Carolina & Georgia.—The organization of this company, the successor of the old South Carolina road, has been completed, and the new company has taken possession of the road. Charles Parsons has been elected President. The company has issued \$5,000,000 of stock and \$5,250,000 five per cent. 25-year first mortgage bonds. About \$1,800,000 of the stock will remain in the treasury of the company. The bonds are issued at the rate of \$21.350 per mile, and the fixed charges of the new company are \$262,000 a year. Mr. Parsons is understood to have acquired \$4,000,000 of the new stock.

Toledo, Ann Arbor & North Michigan.—Ex-President Ashley has filed a suit against that company to recover \$322,000 for salary as President, and sums alleged to have been advanced to the company.

Union Pacific.—The earnings for all the roads controlled by this company, including Central Branch, and one-half of the operations lines in which the Union Pacific has a one-half interest, are reported in the following table:

Month of March.	1894.	1893.	Decrease.
Gross earn.	\$2,378,560	\$3,216,355	\$837,795
Oper. expen. (excl. taxes)	1,877,715	2,296,168	418,453
Net earnings	\$500,845	\$920,186	\$419,341
Three months:			
Gross earn.	\$6,851,252	\$9,235,634	\$2,384,381
Oper. expen. (excl. taxes)	5,351,929	6,576,910	1,224,980
Net earn.	\$1,499,322	\$2,658,724	\$1,159,401

Earnings of various divisions are reported below:

UNION PACIFIC.			
Month of March.	1894.	1893.	Decrease.
Gross earn.	\$1,070,095	\$1,426,937	\$356,841
Net earn.	256,281	470,318	214,037
Three months to March 31.			
Gross earn.	\$3,096,230	\$4,092,505	\$996,275
Net earn.	833,565	1,426,881	593,316
OREGON SHORT LINE & UTAH NORTHERN.			
Month of March.	1894.	1893.	Decrease.
Gross earn.	\$394,132	\$510,005	\$115,873
Net earn.	116,306	189,596	73,290
UNION PACIFIC, DENVER & GULF.			
Month of March.	1894.	1893.	Decrease.
Gross earn.	\$223,460	\$318,927	\$95,467
Net earn.	48,709	46,440	2,269

Western North Carolina.—This railroad, a division of the Richmond & Danville, will be sold at auction at Statesville, N. C., on August 21, by the attorney for the road.

TRAFFIC.

Traffic Notes:

The Pennsylvania will begin its summer time table on May 27, and the time of the New York & Chicago limited will be reduced to 24 hours, making it the same as that announced by the New York Central. The train will leave New York at 10 a. m., and leave Chicago at 5.30 p. m.

The receivers of the New York & New England have filed a new complaint in the United States Circuit Court at Hartford, against the New York, New Haven & Hartford road, alleging unjust discrimination in freight transactions, and that the agents of the defendant prevent shippers from sending freight over the New York & New England.

It is reported that the New York, New Haven & Hartford will not run special White Mountain and Newport express trains the coming summer. The reporters assert that this decision is made because travel is likely to be light; but more probably it means that these special trains will be run whenever necessary, as sections of other trains, thus avoiding the necessity of running trains on stormy days and on those days late in the season when the mountain and seashore traffic is very light.

The Iowa Supreme Court has affirmed the decision of the Shelby District Court in the so-called joint rate case, finding for the plaintiffs and against the State Railroad Commissioners. The railroad companies made the plea in their petition that the rate in question was illegal because ten days' notice was not given, it being a new rate. The defense claimed that it was an amendment to the original schedule of 1888, and that it was therefore not necessary to give the ten days' notice prescribed by law.

The representatives of the railroads refused to appear at the hearing before the Kansas State Board of Railroad Commissioners last week on the question of a wholesale reduction of freight rates. The General Attorney of the Missouri Pacific is quoted as saying: "The refusal of the railroads to appear in the case has taken away from the Board the opportunity to make political capital out of the hearing. We know the Board made up the schedule of rates (which it intended to put in effect) several weeks ago, and the case was decided by the Board before it was commenced. Had we appeared and made a fight we would practically have acknowledged their jurisdiction."

The sub-committee of the Senate Committee on Interstate Commerce has submitted new amendments proposing to change section 10 of the present law, and impose a penalty of \$1,000 upon any person who shall deliver property for transportation to a common carrier, and by false billing, false classification, false weighing, false representation of the contents, or by any sort of deceit or device obtain or seek to obtain transportation for such property at less than the regular rates. A like penalty is imposed upon the agent of any railroad who may assist in such deceit. A new regulation is also made in regard to rebates, which makes the offence a misdemeanor, subject to a fine of not more than \$5,000.

Chicago Traffic Matters.

CHICAGO, May 23, 1894.

A mass meeting of presidents and executive officers of Western lines convened here this morning for the consideration of plans for the future maintenance of rates. The

following roads are represented: Atchison, Topeka & Santa Fe, Chicago & Alton, Chicago, Burlington & Quincy, Chicago, Milwaukee & St. Paul, Chicago, Rock Island & Pacific, Illinois Central, Missouri Pacific, Texas & Pacific, Missouri, Kansas & Texas, Union Pacific, and the Wabash. President Hughitt, of the Northwestern, was made chairman of the meeting. This meeting has to face the most serious problem concerning Western traffic matters that has arisen since the formation of the famous gentlemen's agreement, so-called. The Atchison, the Missouri Pacific, the Union Pacific and the Wabash had already agreed to join in a restoration of all freight rates, subject to the condition that some plan of action be determined upon at this meeting to ensure the maintenance of rates so restored. The Atchison, Missouri Pacific and the Missouri, Kansas & Texas gave notice of restoration effective May 29, all the other roads having agreed to restore May 23. Much depends upon the outcome of this meeting. Should it prove harmonious, and the lines represented agree upon some plan for future maintenance of rates, it is not probable that the traffic men will again make such haste to reduce them. The general opinion is that the only plan which can be adopted to this end is one substantially providing for a physical division of the business with a sufficient penalty attached to ensure its being kept. Unless the present agreement of the Western Freight Association is remodeled on some such line, the general impression appears to be that it will be useless to attempt to enforce it.

No progress has yet been made toward a settlement of the passenger disagreements in Western territory. Several conferences were held last week without reaching any agreement, and the meeting finally adjourned subject to the call of the chair. The Atchison firmly maintains that immigrant rates question must be first disposed of, and the Union Pacific become a member of the clearing house, or at least give satisfactory assurances that its business will be turned over to the joint agent. Some of the other lines want to have the other matters, such as excursion rates and general maintenance of all rates, taken up and considered at the same time. The outlook to-day is far from reassuring. One of the aggravating features connected with these rates is the action of many of the lines in offering special inducements for the Colorado excursion business in the nature of side rides, such as a free ride to the summit of Pike's Peak, rides to Manitou, etc. Each road appears to be trying to outdo the other. There is little hope that anything can be saved out of the wreck of excursion business, but the gravity of the situation lies in their disturbing effect upon other rates.

Western and Southwestern lines terminating at Chicago and Hammond, Ind., have decided to add \$20, arbitrary for switching charges on all business in and out of the Union stock yards and at Hammond on account of the action of the stock yard managers in charging switching both in and out. Heretofore a charge has been made only on out business, which charge has been absorbed by the roads.

It having been found impossible to handle home seekers rates through the machinery of the Association, it has been agreed that the roads may take individual action in allowing these rates to be quoted over their lines. In Western territory the Northern Pacific has agreed to allow them, but the Canadian Pacific refuses to do so, and the Great Northern consents only for such business as does not go to Canadian Pacific territory.

The Reading Despatch, National Despatch and Great Eastern fast freight lines have adopted the "common law" form of bill of lading.

There is some talk of the roads establishing a joint office for the redemption of unused portions of tickets. Probably nothing will be done until it is known whether the roads propose to join forces in prosecuting the brokers under the anti-scalping law.

The Alton has taken the initiative and announced summer tourist rates to points in Wisconsin and Minnesota, effective May 20. The other roads were not agreed and the summer rate sheet has consequently been delayed.

Western lines have again refused to recognize the differential rates quoted by the "Soo Pacific" line in connection with the Canadian Pacific to North Pacific coast points from St. Paul. The latest application for recognition came through the Northern Pacific which is anxious to meet the rates. Chicago-St. Paul lines insist upon locals to St. Paul.

There are as yet no indications of a compromise on the question of through rates between Western and Eastern lines. The Central Traffic Association has notified the Western connections that unless they recede from their present notice not to pro-rate on arbitrators at Eastern points, all East-bound divisions, including those on trans-Mississippi traffic, will be withdrawn June 1 on all traffic destined to and East of the Western termini of the trunk lines, and that they will on May 28 take similar action as to points between Chicago and St. Louis. The Western lines show no sign of receding and apparently propose to fight it out.

East-bound shipments last week fell off considerably, which may be taken either as an indication that rates are being better maintained, or that the traffic has been largely sent forward in anticipation of the effect of the arbitrator's decision regarding a distribution of the business. As the decision has already been made and is in possession of the roads, the movement of traffic for the next few weeks will be watched with some interest for the purpose of ascertaining what the effect is.

The Wabash has shortened its schedule between St. Louis and this city 35 minutes.

The shipments of East-bound freight, not including live stock, from Chicago, by all the lines for the week ending May 19, amounted to 47,523 tons, against 52,856 tons during the preceding week, a decrease of 5,333 tons, and against 52,343 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	W'k to May 19.		W'k to May 12.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central.....	4,742	9.9	5,570	10.5
Wabash.....	4,610	9.7	5,787	11.0
Lake Shore & Mich. South ..	6,535	13.8	8,382	15.9
Pitts., Ft. Wayne & Chicago.	4,653	9.8	4,452	8.4
Pitts., Cin., Chicago & St. L....	6,316	13.3	5,789	11.0
Baltimore & Ohio.....	2,599	5.5	3,260	6.2
Chicago & Grand Trunk.....	4,899	10.3	7,522	14.2
New York, Chic. & St. Louis ..	5,178	10.9	4,871	9.2
Chicago & Erie.....	5,731	12.1	5,250	9.9
C. C. C. & St. Louis.....	2,260	4.1	1,973	3.7
Totals.....	47,523	100.0	52,856	100.0

Of the above shipments, 1,454 tons were flour, 18,832 tons grain and millstuff, 6,617 tons cured meats, 11,309 tons dressed beef, 1,607 tons butter, 1,010 tons hides and 5,371 tons lumber. The three Vanderbilt lines carried 34.6 per cent., the two Pennsylvania lines 23.1 per cent., Lake lines carried 50,720 tons against 54,875 tons last week.

Other Chicago Traffic News will be found on Page 375.